DOCUMENT RESUME

ED 323 398 CE 055 806

AUTHOR	Doyle, Gina
TITLE	Pharmacology. Teacher Edition.
INSTITUTION	Oklahoma State Dept. of Vocational and Technical Education, Stillwater. Curriculum and Instructional Materials Center.
PUB DATE	90
NOTE	583p.
AVAILABLE FROM	Curriculum and Instructional Materials Center, Oklahoma Dept. of Vocational and Technical Education, 1500 West Seventh Avenue, Stillwater, OK 74074 (order no. HO1031: $29.00).
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF03 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Competency Based Education; *Drug Therapy; *Nursing Education; Occupational Information; *Pharmacology; Postsecondary Education; Secondary Education; State Curriculum Guides; Vocational Education
IDENTIFIERS	*Oklahoma

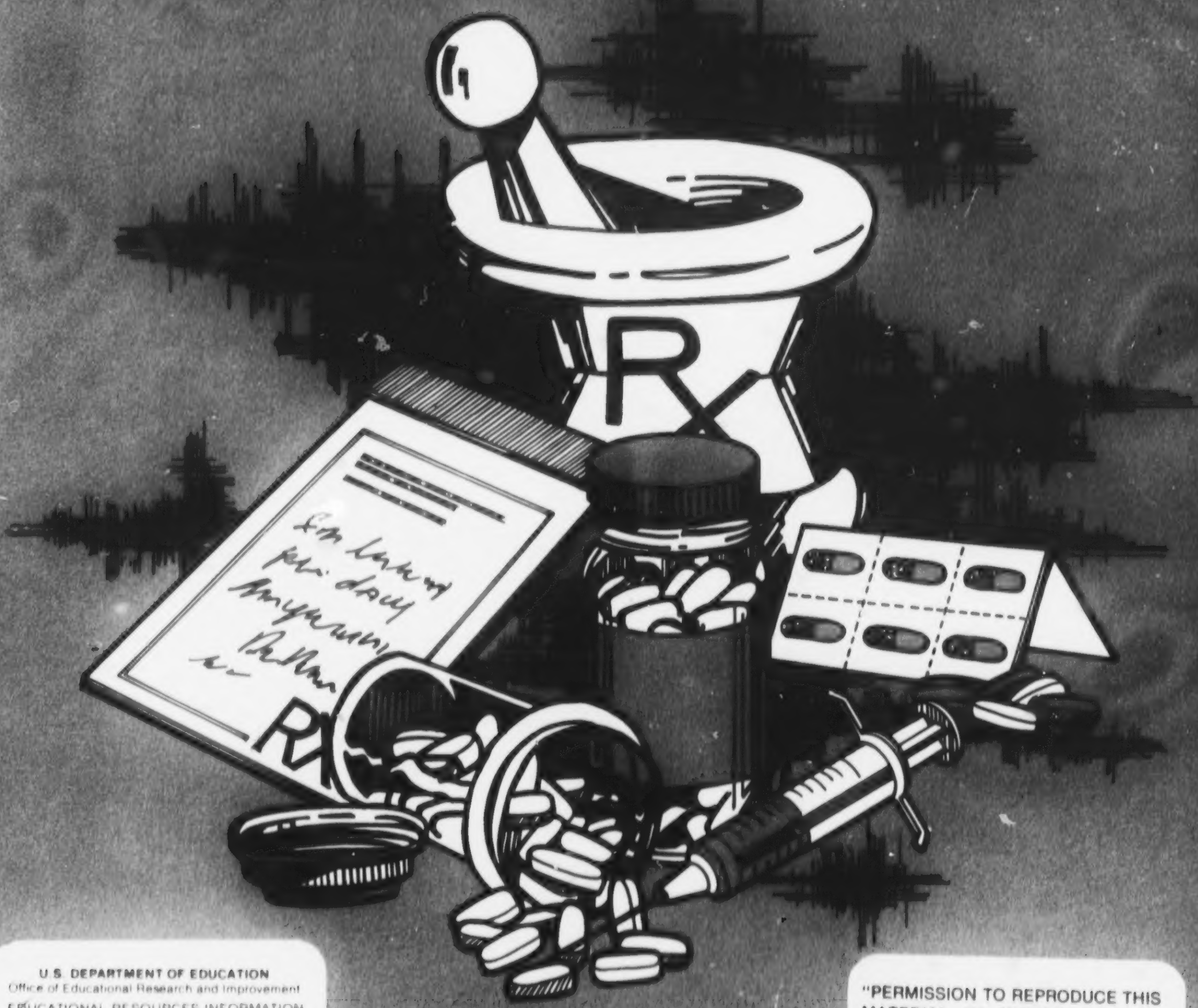
ABSTRACT

This publication is one of the courses from the Practical Nursing series of competency-based training programs designed to coordinate the job related experience and knowledge needed by personnel working in a practical nursing position. The course includes five units. Each unit includes some or all of the following components: objective sheet, suggested activities, transparency masters, handouts, information sheet, supplements, activity sheets, assignment sheets, and test. The unit components focus on measurable and observable learning outcomes. The five units are designed to enable students to: (1) calculate medication dosage; (2) document medications; (3) identify classification and effects of medication; (4) administer medications; and (5) assist with intravenous therapy. (CML)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

PHARMACOLOGY

TEACHER EDITION



ED323398

CE055206

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

S Stone

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

OKLAHOMA CIMC

Oklahoma Department of
Vocational and Technical Education
Stillwater, Oklahoma

HO 1031

Pharmacology

Developed by the
Curriculum and Instructional Materials Center
for the division of Health Occupations
Oklahoma Department of Vocational and Technical Education

Copyright 1990
Oklahoma Department of Vocational and Technical Education
Curriculum and Instructional Materials Center

All rights reserved.

Printed in the United States of America by the
Oklahoma Department of Vocational and Technical Education
Stillwater, Oklahoma 74074-4364

This publication, or parts thereof, may not be reproduced in any form by photographic, electrostatic, mechanical, or any other method, for any use including information storage and retrieval, without written permission from the publisher.

The Oklahoma Department of Vocational and Technical Education does not discriminate on the basis of race, creed, color, national origin, sex, age, veteran status, or qualified handicap.

PHARMACOLOGY

TABLE OF CONTENTS

Unit **Page**

Unit I

Calculate Medication Dosage I-1

Unit II

Document Medications II-1

Unit III

Identify Classification and Effects of Medication III-1

Unit IV

Administer Medications IV-1

Unit V

Assist with Intravenous Therapy V-1

FOREWORD

This publication is one of the courses from the Practical Nursing series of competency-based training programs designed to coordinate the job related experience and knowledge needed by personnel working in a practical nursing position.

The information found in each of the courses in the Practical Nursing series will help you in planning and implementing a current, practical approach to learning. Although this series reflects a systematic approach to instructional materials development and the latest in educational technology innovations, the instructor should adapt and modify information in the Practical Nursing series to coincide with local conditions and specific student/client needs.

ROY PETERS, JR.
State Director,
Oklahoma Department of Vocational
and Technical Education

MARY M. RANDALL
State Supervisor
Health Occupations Divison
Oklahoma Department of Vocational
and Technical Education

PREFACE

The nursing profession and the role the nurses assume today are greatly changed from past years. Depending on the local situation the nurse may find the responsibilities specifically defined and very restrictive or all encompassing. Large facilities tend to have more specialized teams while small or rural facilities may rely on the nurse to "do it all."

Realizing the constraints of time and energy, the Curriculum and Instructional Materials Center Staff designed this series toteach competencies that would train the nurse to perform tasks that would be expected on the job, no matter what size the facility or where it was located. Safety precautions for working with patients was also heavily stressed. *Pharmacology* is but one course in the Practical Nursing series.

Several concepts are integrated throughout the series. Nursing process, patient teaching, wellness, nutrition, safety, life span, medication, documentation, cultural differences and professional leadership and development are all included when appropriate.

Nursing educators must make decisions concerning the amount and depth of information needed in the curricula to prepare students to meet the challenges they will find in the nursing profession today. The Practical Nursing series provides the basic information needed today to prepare nurses for tomorrow.

PHYLLIS A. TARRANT, Ph.D.
Curriculum Development Specialist
Oklahoma Department of
Vocational and Technical Education

ACKNOWLEDGEMENTS

Thank-you goes to the following ad hoc committee members who contributed their time, talents, and knowledge in determining the content of this manual:

Donna Carter
Hydro, Oklahoma

David Cross
Baptist Care Advantage
Oklahoma City, Oklahoma

Dr. Lou Ebrite
Teacher Educator
Health Occupations Education
Central State University
Edmond, Oklahoma

Violet Higgins
Ponca City, Oklahoma

Elsie Jones
Hobart, Oklahoma

Sally McGowen, RN
Practical Nursing Instructor
Kiamichi AVTS
Poteau, Oklahoma

Jeanie Meyer, RN
Nursing Instructor
Oklahoma State University
Technical Branch
Oklahoma City, Oklahoma

Sulinda Moffett, RN, M.S.
Executive Director
Oklahoma Board of Nurse Registration
and Nursing Education
Oklahoma City, Oklahoma

Charlotte Rappsilber, RN, Ph.D.
Associate Director for Nursing Education
Oklahoma Board of Nurse Registration
and Nursing Education
Oklahoma City, Oklahoma

Debra Thomas, RN
Practical Nursing Coordinator
Pontotoc County AVTS
Ada, Oklahoma

Thank-you also to the staff of the Oklahoma Department of Vo-Tech, to Dr. Roy Peters, Jr., Director, to Dr. Charles O. Hopkins, Assistant State Director, to Mary M. Randall, RN, State Supervisor of Health Occupations Education, to Gail Pearson, RN, Assistant State Supervisor of Health Occupations Education, and to Sheila Stone and Greg Pierce, who led the curriculum staff during the development of the Practical Nursing series.

A special thank-you to Gina Doyle, RN, for writing Pharmacology and to Sherry Wietelman, Curriculum Specialist, for final editing. Thank-you also to word processors Kim Taylor and Angela Freck; desktop publishing operator Brenna Tillman; and publications design specialist Michelle Sharp.

USE OF THIS PUBLICATION

INSTRUCTIONAL UNIT

The format of *Pharmacology* includes basic components that form a unit of instruction: objective sheet, suggested activities, transparency masters, handouts, information sheet, supplements, activity sheets, assignment sheets and test.

The unit components "zero in" on measurable and observable learning outcomes. When applicable, the unit includes activities that use the affective domain. Instructors may supplement, personalize, localize, and motivate with these materials to develop a complete teaching/learning process.

The instructor will need to decide methods of presentation and demonstration to meet the needs of students. Careful study of each unit of instruction will help the instructor plan the presentations:

- How to use materials for independent study
- Amount of material to cover in each class period
- Supplies and equipment needed
- Skills that must be demonstrated
- Amount of class time needed for demonstrations
- Amount of time needed for practice
- Supplementary materials, such as pamphlets or videos, to order
- Resource people to contact

Objective Sheet (white pages)

Each unit of instruction is based on the knowledge and skills needed for successful employment in an occupational area. Objectives are stated in two forms: unit objective stating the subject matter to be covered in a unit of instruction, and specific objectives stating the performance necessary to reach the unit objective. Because the objectives of the unit provide direction for the teaching/learning process, teachers and students must have a common understanding of the intent of the objectives. Each student should have a copy of the objective sheet to refer to throughout the teaching/learning process. This will help answer any questions concerning performance requirements.

The objectives can also help determine teaching strategies and instructional methods. Prepare for each unit by deciding how each objective can best be taught, depending on individualized or class instruction. Instructors should feel free to modify, delete, or add objectives to meet the needs of the students and community. If there are changes in the objectives, the instructor should supply the additional information, assignment, procedure, or activity sheets, and criterion test items.

Suggested Activities (pink pages)

This component is included only in instructor material. The suggested activities page assists the instructor during the preparation stage of the teaching/learning process by providing suggestions for delivery and/or presentation during the instructional process. Read the suggested activities before teaching the units to allow time to obtain supplemental materials, prepare audio-visual materials, and contact outside resources. Duties of the instructor will vary according to the particular unit.

The references that are listed are ones used in the development of each unit. They should be used by the instructor to provide supplemental knowledge about the subject or to help students with particular interests or occupation objectives.

Handouts (white pages)

Handouts are additional teaching aids that support portions of the information sheet. Handouts include such activities as games, puzzles, and additional information (which is intended to be used as the instructor deems necessary.)

Handouts may be photocopied for classroom use only.

Pretests (yellow pages)

This component provides a pre-assessment of the knowledge that a student possesses prior to instruction. In individualized instruction, a student may challenge out of studying some or all of the cognitive objectives. In a group instructional setting, instructors may evaluate the knowledge that a group of students brings with them and determine where instruction should be emphasized.

Information Sheet (green pages)

The information sheet provides "must know" content essential for meeting the objectives of the unit. The information is keyed to the specific objectives. Boxed items contain "nice-to-know" information and are not on the tests. The information sheet may also include "Notes," "Cautions," or "Warnings"; discuss these carefully and thoroughly.

Notes are short verbal additions to the information sheet that provide nice-to-know and decision-making information. A note may tell the student what to watch for or to consider at a given step. It may explain when a step may not be applicable. Notes offer guidance that may help the student understand the process and do it more efficiently.

Cautions are advisories that tell how to avoid damage to equipment or facilities.

Warnings are advisories that tell the student how to avoid personal injury or death to the student, client, or other persons in the workplace.

Supplements (green pages)

Supplements include material that provides additional information for understanding the topic but does not have direct application to specific objectives.

Transparency Masters (white pages)

Transparency masters provide information in a special way. Transparencies direct the class's attention to the topic of discussion. Transparencies may present new information, or they may reinforce information presented in the information sheet. They are particularly effective when identification is necessary. Make transparencies and place them in the notebook where they will be immediately available for use.

Activity Sheets (tan pages)

The purpose of activity sheets is to provide activities not directly in support of any one objective but that support several objectives or seek to influence the student's beliefs, attitudes, or appreciation of the study area.

Activity sheets vary greatly in their number and design. Some deal with the student attitudes and beliefs. These are not intended for review by anyone other than the student. Some activity sheets require the student to make written or oral reports.

Assignment Sheets (tan pages)

Assignment sheets provide written exercises for instruction and practice of a specific objective. The introduction to the assignment sheet explains how the assignment sheet relates to the subject area and unit objectives and may provide instructional information or refer students to another component for such information.

Assignment sheets are intended to provide students with practice in exercising higher-order thinking skills. Often, assignment sheets will contain case studies or story problems or other situations in which the student must analyze the circumstances and determine correct responses.

Job Sheets (blue pages)

Job sheets are another important segment of a unit of instruction. The job sheets provide a list of equipment, tools, and materials needed to complete each task or job. Diagrams, photographs, and illustration are provided to assist students in achieving the skill.

The instructor should demonstrate to students the procedure outlined in each job sheet. Further more, the instructor needs to localize the job sheet according to the equipment and supplies available in the local lab or shop situation. Job sheets also furnish potential employers with a picture of the skills being taught and the performances they might reasonably expect from a person who has had this vocational instruction.

Practical Tests (yellow pages)

Practical tests or evaluation sheets are intended to provide consistency in evaluating performance objectives.

Written Test (yellow pages)

The test provides criterion-referenced evaluation on every objective listed in the unit of instruction. The instructor may individualize the test as needed.

Written Test Answers (pink pages)

The acceptable response on a unit test, 85 percent in most units, applies to the overall score, not to each individual question. The final unit grade should be obtained by using the paper/pencil score along with evaluations for students' demonstration of the desired skills.

Answers to Pretest, Assignment Sheets, Written Test Answers (pink pages)

These components are designed to assist the instructor in evaluation of student performance. They are available in the teacher's edition only.

PAGE NUMBERING

Each publication for the Curriculum and Instructional Materials Center is assigned a specific abbreviation. *Practical Nursing* has been abbreviated PN. Each section is assigned a specific letter. For example, "Medication Dosage" is Unit I in the *Pharmacology* book in the *Practical Nursing* series. Each unit in the publication begins with page 1. Each page number gives the component name, abbreviation of the book, section letter, unit number within the section, and page number within the unit. Since CIMC publications are loose-leaf, this system of page numbering was recently adopted so that pages from different manuals would not get mixed up. The page number for the objective sheet in "Medication Dosage," which is the first unit in the *Pharmacology* book, would look like this:

OBJECTIVE SHEET - PN - Pharmacology
I - 1

METHODS OF DISSEMINATING MATERIAL

For best results, provide student materials for each student. Student materials contain everything but the instructor's supplements and answers to the test.

TEACHING METHODS

Keeping students motivated is a challenge. Supplement the objectives by providing the "why," personal experiences, and current information. If you are going to teach the material in a group setting, prepare for the unit by deciding the best way to teach each objective and allow for student input.

If you are going to follow the plan for individualized instruction, provide opportunities that will allow each student to become involved in planning for and being responsible for his or her own education.

COMPETENCY PROFILES

A competency profile is available for each CIMC publication. Competency profiles document student performance. The profile contains a list of the specific job competencies that a student should achieve before leaving the training program. Profiles should be distributed to students as required.

CORRECTIONS AND SUGGESTIONS

The Curriculum and Instructional Materials Center (CIMC) wants to provide vocational instructors and students with materials that are accurate and effective. Although the CIMC strives to maintain the highest standards of development and production, oversights occasionally do occur. If you find any errors in this or other CIMC publications, or have suggestions for improving their usefulness in vocational programs, please notify the CIMC staff. One easy way of pointing out errors is to make a photocopy of the affected page and to indicate the correction on the copy. Mail this information to the CIMC, where it will be used to correct the publication before the materials are reprinted.

To ensure that the material is updated on a timely basis, notify the CIMC of necessary corrections as soon as possible after discovering the error. Do not assume that someone else will notice the error and inform the CIMC; other users may be making the same assumption. Please send corrections and recommendations for improving this publication to the following address:

Curriculum and Instructional Materials Center
Oklahoma Department of Vocational and
  Technical Education
1500 West Seventh Avenue
Stillwater, Oklahoma 74074-4364

OBJECTIVE SHEET

CALCULATE MEDICATION DOSAGE

I

INTRODUCTION

Medication dosage is a vital part of understanding medications. The dosage is the amount of medication to be used. The importance of complete accuracy in calculating a dosage of medication cannot be stressed enough. Clients may be as adversely affected by not getting enough medication as by getting too much. Checking answers closely and following procedures provides the best defense against possible errors that can harm the client and jeopardize the nurse.

Review and study of the math required to calculate dosage amounts will help you build proficiency in basic calculations. You will study decimals and fractions used as well as ratios and proportions to improve your skills and accuracy. You will use apothecary and metric systems to calculate dosages. With practice these measurement systems will be as easy or easier than using household measurements.

Learning the calculation skills necessary to provide the correct amount of medication for a patient is important in becoming a practical nurse. Accuracy of calculation must be 100% on dosages of medication to insure the safety of clients. This unit will help to build confidence in these much needed skills.

UNIT OBJECTIVE

After completing this unit, the student should be able to calculate drug dosages as preparation for administration of medication. The student will show these competencies by completing the assignment sheets and written test with a minimum of 85 percent accuracy.

PREREQUISITES

Before studying this unit, the student should be able to perform basic math skills in addition, subtraction, multiplication, and division. Additionally, the student should understand how to calculate equations involving fractions, decimals, ratios and proportions, and formulas.

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Identify the units in each measurement system used in pharmacology.

2. Distinguish between characteristics of each system of measurement.
3. Interpret verbal and written numbers.
4. Calculate using basic math skills: addition, subtraction, multiplication, and division.
5. Calculate using fractions.
6. Calculate using decimals.
7. Calculate ratios and proportions.
8. Read and write apothecary Roman numerals.
9. Determine equivalents among the three systems of measurement.
10. Convert medication dosages from one unit of measurement to another unit of measurement.
11. Determine the information necessary for dosage calculation.
12. Use one method of dosage calculation.
13. Calculate medication dosages proportionate to body weight.
14. Calculate medication dosages for infants and children using Clark's rule.
15. Determine correct action to follow when calculated results show unusual dosage results. (Assignment Sheet 1)

CALCULATE MEDICATION DOSAGE

PREPARATION

- Order materials to supplement unit.
- Invite a pharmacist or lawyer to discuss legal issues involved in giving medications.

  NOTE: Supply guest speaker with the objective sheet, information sheet, and any other component you want him/her to discuss.
- Decide how you will set up demonstration and testing schedule.
- Obtain copies of the nomogram used to compute pediatric dosages by body surface.

DELIVERY

Objective 1

- Make flash cards to teach the units in each system.
- Discuss the Metric System, to help students understand the consistency involved in the metric system.

Objective 2

- Discuss the history of each measurement system.
- Relate to students the measurement system that is being used in the area where they live.
- Provide different measuring devices in each system and prepare posters to explain their use.

Objective 3

- Discuss the importance of listening when verbal or phone orders are taken.
- Send a medication order to be whispered to each person (like the game of gossip), and see how it changes before the end.
- Have students role play repeating orders to each other correctly.
- Write various numbers and have students read them aloud.

- Complete Activity Sheet 1.

Objective 4

- Use flash cards for a quick over-all review.
- Provide an individualized study of the basic math skills for those who need extra practice.
- Have groups develop basic math problems. Then have the groups trade and work as separate teams to solve them.
- Complete Activity Sheet 2.

Objective 5

- Have students bring recipes, and change the number served. (This could also be used to practice ratio and proportions in Objective 7.)
- Have students visualize parts of a pie, or use cases of soft drinks to demonstrate the concept of a whole with several pieces.
- Complete Activity Sheet 3.

Objective 6

- Use money to demonstrate the use of decimals in daily life in giving and receiving change.
- Use your grading system to illustrate decimal numbers, if applicable.
- Complete Activity Sheet 4.

Objective 7

- Discuss how ratio and proportion is used for planning group activities, such as for parties.
- Give illustrations of constant proportions in daily life.
- Complete Activity Sheet 5.

Objective 8

- Stress the importance of having legible Roman numerals when transcribing orders, if this is used in your local area.
- Complete Activity Sheet 6.

Objective 9

- Have students highlight the equivalents that you feel are the most useful in your area.
- Have students use their knowledge of household measurement to understand amounts in other systems.
- Provide utensils that measure in each of the systems of measurement, and allow the students to see how the amounts relate to one another.
- Read Supplement 1. Complete Activity Sheet 7.

Objective 10

- Specify the method you prefer, or allow the students to read the supplement and find the method easiest for them.
- If student has difficulty, use conversion of dollars to pennies and vice versa as an interim step (two places).
- Use syringes and medicine cups to show various measurements and how they compare.
- Read Supplement 2. Complete Activity Sheet 8.

Objective 11

- Discuss with students the alternate terms that are used to describe the three pieces of information necessary for dosage calculation. Remind the students that the meanings are still the same.
- Provide sample orders, and have students label the parts that are necessary for calculation of dosage.
- Complete Activity Sheet 9.

Objective 12

- Give students the method you prefer and explain your reasons for preferring it or allow the students to choose a method from those listed in the supplement.
- Read Supplement 3. Complete Activity Sheet 10.

Objective 13

- Discuss how mg/kg of body weight increases the effectiveness of medication for the individual client.
- Have students look up common medications to find the mg/kg recommended.
- Complete Activity Sheet 11.

Objective 14

- Discuss why weight is more accurate than age (growth and development).
- Give students the method preferred by the local facility if Clark's rule is not used in your local facility.
- Hand out copies of nomogram used in computing pediatric dosage using body surface.
- Read Supplement 4. Complete Activity Sheet 12.

Objective 15

- Discuss standard procedure expected of students and how this procedure will change when working as a practical nurse.
- Find written policies from several facilities to illustrate slight differences. Stress awareness of policies, as well as correct action.
- Find examples of lawsuits that are solely based on an individual's failure to follow standard policy in a drug dosage situation.
- Complete Assignment Sheet 1.

EVALUATION

Pretest

- Pretest qualifying students.
- Determine individual study requirements from pretest results.
- Counsel students individually on pretest and study requirements.
- Modify materials in unit or create supplementary materials for individual students as required.

Written Test

- Explain to students that they will be asked to demonstrate on the written test action listed in the specific objectives.
- Give the written test.
- Evaluate students on assignments sheet activities if not previously done.
- Reteach and retest if necessary.
- Complete appropriate section of competency profiles.
- Review individual and group performance in order to evaluate teaching methods. Adjust scope, sequence, or instructional approaches for additional lessons required.

SUGGESTED RESOURCES

Computer Programs

- *Calculation of Drug Dosages*, CA Career Aids, 20417 Nordhoff Street, Dept. HA Chatsworth, CA 91311, (818) 341-2535.
- *Fraction Factory: Math Games for Children*. Disney Educational Software, P.O. Box 2000, Thornwood, NY 10594.
- *Math Sequence Series*. Milliken Publishing Company, Disney Educational Software, P.O. Box 2000, Thornwood, NY 10594. (Includes addition, subtraction, multiplication, division, and fractions.)

Publications

- Bayt, Phyllis Theiss. *Administering Medications: A Competency-Based Program for Health Occupations*, The Bobbs-Merrill Company, Inc., 1982.
- Clayton, Bruce D., Stock, Yvonne N., and Squire, Jessie E. Squire's *Basic Pharmacology for Nurses*, 8th edition, C. V. Mosby Company, 1985.
- Johnson, Grace G. *Mathematics for Nurses*, 2nd edition, Appleton-Century-Crofts, 1986.
- Lannon, Margaret C. and Virginia Poole Arcangelo . *Essentials of Clinical Pharmacology and Dosage Calculation*, Second edition, J.B. Lippincott Company, Philadelphia, 1986.

- *Nurses' Legal Handbook*, Springhouse Corporation, 1987. 1111 Bethlehem Pike, Springhouse, PA 19477.
- Rice, Jane and Esther G. Skelley. *Medications and Mathematics for the Nurse*, 6th Edition, Delmar Publishers, Inc., 1988.
- Woodrow, Ruth. *Essentials of Pharmacology for Health Occupations*, John Wiley and Sons, Inc., 1987.

UNIT REFERENCES

Computer Programs

- *Calculation of Drug Dosages*, CA Career Aids, 20417 Nordhoff Street, Dept. HA Chatsworth, CA 91311, (818) 341-2535.
- *Fraction Factory: Math Games for Children*. Disney Educational Software, P.O. Box 2000, Thornwood, NY 10594.
- *Math Sequence Series*. Milliken Publishing Company, Disney Educational Software, P.O. Box 2000, Thornwood, NY 10594. (Includes addition, subtraction, multiplication, division, and fractions.)

Publications

- Bayt, Phyllis Theiss. *Administering Medications: A Competency-Based Program for Health Occupations*, The Bobbs-Merrill Company, Inc., 1982.
- Clayton, Bruce D., Stock, Yvonne N., and Squire, Jessie E. Squire's *Basic Pharmacology for Nurses*, 8th edition, C. V. Mosby Company, 1985.
- Johnson, Grace G. *Mathematics for Nurses*, 2nd edition, Appleton-Century-Crofts, 1986.
- Lannon, Margaret C. and Virginia Poole Arcangelo . *Essentials of Clinical Pharmacology and Dosage Calculation*, Second edition, J.B. Lippincott Company, Philadelphia, 1986.
- *Nurses' Legal Handbook*, Springhouse Corporation, 1987. 1111 Bethlehem Pike, Springhouse, PA 19477.
- Rice, Jane and Esther G. Skelley. *Medications and Mathematics for the Nurse*, 6th Edition, Delmar Publishers, Inc., 1988.

- Woodrow, Ruth. *Essentials of Pharmacology for Health Occupations*, John Wiley and Sons, Inc., 1987.

PRETEST ANSWERS

CALCULATE MEDICATION DOSAGE I

OBJECTIVE 1

1. H
2. M
3. A
4. M
5. M
6. H

OBJECTIVE 2

1. Metric
2. Apothecary
3. Household
4. Household
5. Metric

OBJECTIVE 3

1. a. Six hundred eighty nine thousand four hundred
   b. Two million, three thousand, five
   c. Seven hundred ninety one and twenty five hundredths
   d. Three and forty two thousandths
   e. One hundred twenty five and one hundred twenty five thousandths
2. a. 65,023
   b. 1,000,800,000
   c. 4,982
   d. 655.3
   e. 2.475

OBJECTIVE 4

1. 1087
2. 361
3. 2478
4. 3000
5. 12

OBJECTIVE 5

1. a. 4
   b. 2 2/8 or 2 1/4
   c. 25
   d. 6 1/12
   e. 20 13/25
2. a. 7/8
   b. 1 29/60
   c. 2 11/24
   d. 10 3/4
   e. 2 13/18
3. a. 5/12
   b. 5/10 or 1/2
   c. 2 1/16
   d. 8/15
   e. 2 23/28
4. a. 28/45
   b. 1/24
   c. 1/4
   d. 5/6
   e. 26 19/20

5. a. 1 2/3
   b. 2 2/3
   c. 6 1/2
   d. 2

OBJECTIVE 6

1. a. 0.79
   b. 2.174
   c. 12.095
   d. 1971.381
2. a. 0.914
   b. 0.6977
   c. 0.36
   d. 24.285
3. a. 0.055
   b. 0.759
   c. 0.66734
   d. 80.275
4. a. 4
   b. 80
   c. 2.7030625
   d. 0.76969

OBJECTIVE 7

1. 20
2. 7 1/2 or 7.5
3. 14
4. 1.7
5. 72

OBJECTIVE 8

1. a. 9
   b. 15
   c. 3
   d. 14
   e. 2 1/2
2. a. ii or II
   b. vi or VI
   c. viii or VIII
   d. iss
   e. xiii or XIII

OBJECTIVE 9

1. 1
2. 1
3. 1
4. 60
5. 2.2
6. 1

OBJECTIVE 10

1. a. 6000
   b. 0.45
   c. 0.2
   d. 1250
   e. 20
   f. 0.05

2. a. 2
   b. 60
   c. 80
   d. 1 1/2
   e. 1/75
   f. 15
3. a. 3
   b. 3
   c. 3 1/2
   d. 1 1/2
   e. 132

OBJECTIVE 11

1. N
2. U
3 N
4. U
5. N

OBJECTIVE 12

1. 0.7 cc
2. 1.2 cc
3. 2 tabs
4. 1 cc
5. 10 cc

28

OBJECTIVE 13

1. 750 mg
2. 340 mg
3. 210 mg
4. 1600 mg
5. 100,000 mg or 100 G

OBJECTIVE 14

1. 30
2. 37.5
3. 2/3
4. 33
5. 6

OBJECTIVE 15

Refer to answers to Assigment Sheet 1.

PRETEST | **CALCULATE MEDICATION DOSAGE** **I**

NAME ______________________________ SCORE ________

OBJECTIVE 1

Identify the units in each measurement system used in pharmacology. Write the correct answers in the blanks provided. Write "M" for metric, "A" for apothecary, or "H" for household.

1. tsp ______________
2. G ______________
3. m ______________
4. mg ______________
5. L ______________
6. c ______________

OBJECTIVE 2

Distinguish between characteristics of each system of measurement. Label each statement with the name of the measurement system that it describes.

1. ______________ Most scientifically accurate
2. ______________ Oldest system used for pharmacology
3. ______________ Least accurate system
4. ______________ System most familiar in U.S.A.
5. ______________ System based on tens

OBJECTIVE 3

Interpret verbal and written numbers. Write the correct answers in the blanks provided.

1. Write the following numbers in word form.
   a. 689,400 ______________________________
   b. 2,003,005 ______________________________
   c. 791.25 ______________________________
   d. 3.042 ______________________________
   e. 125.125 ______________________________

2. Express the following numbers in numeral form.
   a. Sixty five thousand twenty three ______
   b. One billion, eight hundred thousand ______
   c. Four thousand nine hundred eighty two ______
   d. Six hundred fifty five and three tenths ______
   e. Two and four hundred seventy five thousandths ______

OBJECTIVE 4

Calculate using basic math skill: Addition, subtraction, multiplication, and division. Calculate the following equations. Write the correct answers in the blanks provided.

1. 145 + 942 = ______
2. 456 - 95 = ______
3. 59 x 42 = ______
4. 24(125) = ______
5. 144 ÷ 12 = ______

OBJECTIVE 5

Calculate using fractions. Write the correct answers in the blanks provided.

1. Express the following fractions as whole or mixed numbers.
   a. 16/4 = ______
   b. 18/8 = ______
   c. 125/5 = ______
   d. 73/12 = ______
   e. 513/25 = ______
2. Add the following fractions.
   a. 1/2 + 1/4 + 1/8 = ______
   b. 1/3 + 3/4 + 2/5 = ______
   c. 1/8 + 6/4 + 5/6 = ______
   d. 2 1/4 + 8 1/2 = ______
   e. 1 2/3 + 8/9 + 1/6 = ______

3. Subtract the following fractions.

a. 3/4 - 1/3 = ______

b. 3/5 - 1/10 = ______

c. 2 1/2 - 7/16 = ______

d. 21 1/3 - 20 4/5 = ______

e. 8 9/14 - 5 23/28 = ______

4. Multiply the following fractions and then reduce them to their lowest terms.

a. 7/10 x 8/9 = ______

b. 1/16 x 2/3 = ______

c. 3/8 x 8/12 = ______

d. 2 1/2 x 1/3 = ______

e. 12 1/4 x 2 1/5 = ______

5. Divide the following fractions and then reduce them to their lowest terms.

a. 5/6 ÷ 1/2 = ______

b. 2/3 ÷ 1/4 = ______

c. 1 3/10 ÷ 1/5 = ______

d. 2 1/2 ÷ 1 1/4 = ______

OBJECTIVE 6

Calculate using decimals. Write the correct answers in the blanks provided.

1. Add the following decimals.

a. 0.2 + 0.06 + 0.53 = ______

b. 1.013 + 0.05 + 1.111 = ______

c. 10.01 + 1.1 + 0.985 = ______

d. 1899.6 +69.981 + 1.8 = ______

2. Subtract the following decimals.

   a. 1.003 - 0.089 = ______________________
   b. 0.702 - 0.0043 = ______________________
   c. 2.13 - 1.77 = ______________________
   d. 25.2 - 0.915 = ______________________

3. Multiply the following decimals.

   a. 0.5 x 0.11 = ______________________
   b. 2.3 x 0.33 = ______________________
   c. 0.547 x 1.22 = ______________________
   d. 12.35 x 6.5 = ______________________

4. Divide the following decimals.

   a. 0.8 ÷ 0.2 = ______________________
   b. 1.6 ÷ 0.02 = ______________________
   c. 8.12 ÷ 3.004 = ______________________
   d. 2.54 ÷ 3.3 = ______________________

OBJECTIVE 7

Calculate ratios and proportions. Write the correct answers in the blanks provided.

Solve the following ratio and proportions.

1. 5 : 1 :: x : 4 x = ______________________
2. 3 : 8 :: x : 20 x = ______________________
3. 21 : 15 :: x : 10 x = ______________________
4. 100 : 2 :: 85 : x x = ______________________
5. 1 : 12 :: 6 : x x = ______________________

OBJECTIVE 8

Read and write apothecary Roman numerals. Write the correct answers in the blanks provided.

1. Express the following Roman numerals as Arabic numerals.

   a. ix ______________________________

   b. xv ______________________________

   c. iii ______________________________

   d. xiv ______________________________

   e. iiss ______________________________

2. Write the Arabic numerals as Roman numerals.

   a. 2 ______________________________

   b. 6 ______________________________

   c. 8 ______________________________

   d. 1 1/2 ______________________________

   e. 13 ______________________________

OBJECTIVE 9

Determine equivalents among the three systems of measurement. Use the chart below to determine the equivalents below. Write the correct answers in the blanks provided.

1. 1 dr = ______________________ tsp
2. 30 ml = ______________________ oz
3. 500 cc = ______________________ pt
4. gr i = ______________________ mg
5. 1 kg = ______________________ lb
6. 15 gr = ______________________ G

Approximate equivalent measures of fluids and weight

	METRIC	APOTHECARY	HOUSEHOLD
	0.060 ml	m i	1 gtt
	1 ml = 1cc	m xv (15 m)	15 gtt
F	5 ml (4)	1 fld. dr, f	1 tsp
L	15 ml	3 f	1 tbsp
U	30 ml	1 fld oz	2 tbsp (1/8 c)
I	250 ml (240)	8 fld oz	1 cup or glass
D	500 ml	16 fld oz	1 pint
	1000 ml = 1L	32 fld oz	1 quart
	4 L	128 fld oz	1 gallon
	0.4 mg	gr 1/150	
	1 mg	gr 1/60	
W	0.060 G = 60 mg	gr i	
E	0.5 G = 500 mg	gr viiss (7 1/2 gr)	1/8 tsp
I	1 G = 1000 mg	gr xv (15 gr)	1/4 tsp
G	4 G = 4000 mg	60 gr = 1 dr	1 tsp
H	15 G	4 dr	1 tbsp
T	30 G	1 oz	2 tbsp
	0.455 Kg	12 oz	1 lb
	1 Kg		2.2 lb

OBJECTIVE 10

Convert medication dosages from one unit of measurement to another unit of measurement. Write the correct answers in the blanks provided.

1. Convert milligrams to grams and grams to milligrams as indicated.

   a. 6 G = ____________________ mg
   b. 450 mg = ____________________ G
   c. 200 mg = ____________________ G
   d. 1.25 G = ____________________ mg
   e. 0.02 G = ____________________ mg
   f. 50 mg = ____________________ G

2. Using the chart on page 22 convert the following metric and apothecary measurements to the measurements indicated in the right column.

   a. 10 ml = ____________________ dr
   b. 2 oz = ____________________ ml
   c. 2.5 L = ____________________ oz
   d. 90 mg = ____________________ gr
   e. 0.8 mg = ____________________ gr
   f. 1/4 gr = ____________________ mg

3. Convert the following from metric or apothecary to household measurements.

   a. 750 ml = ____________________ c
   b. 15 ml = ____________________ tsp
   c. 3.5 L = ____________________ qt
   d. 90 gr = ____________________ tsp
   e. 60 kg = ____________________ lb

OBJECTIVE 11

Determine the necessary information for dosage calculation. Write the correct answers in the blanks provided. Write "N" for necessary to know , and "U" for unnecessary to know when calculating dosages.

____1. Dosage on hand

____2. Total amount on hand

____3. Quantity on hand

____4. Weight of patient

____5. Dosage ordered

OBJECTIVE 12

Use one method of dosage calculation. Write the correct answers in the blanks provided.

Determine the amount of medication to be given according to the information provided.

1. Ordered: Demerol 35 mg On hand: 50 mg/cc
   Give__________

2. Ordered: Vistaril 60 mg On hand: 100 mg/2 cc
   Give__________

3. Ordered: Nifedipine 20 mg On hand: 10 mg/tab
   Give__________

4. Ordered: Codeine 1/2 gr On hand: 30 mg/cc
   Give__________

5. Ordered: Theophylline Elixir 300 mg
   On hand: 150mg/5 cc
   Give________

OBJECTIVE 13

Calculate medication dosages proportionate to body weight. Write the correct answers in the blanks provided.

1. 10 mg/kg with client's weight 75 kg ______________________
2. 5 mg/kg with client's weight 68 kg ______________________
3. 15 mg/kg with client's weight 14 kg ______________________
4. 20 mg/kg with client's weight 176 lbs______________________
5. 1 G/kg with client's weight 100 kg ______________________

OBJECTIVE 14

Calculate the medication dosages for infants and children using Clark's rule of pediatric dosage. Write the correct answers in the blanks provided.

1. Adult dosage is 150 mg. Child's weight is 30 pounds.
   ______________ mg
2. Adult dosage is 75 mg. Child's weight is 75 pounds.
   ______________ mg
3. Adult dosage is 1 gr. Child's weight is 100 pounds.
   ______________ gr
4. Adult dosage is 100 mg. Child's weight is 50 pounds.
   ______________ mg
5. Adult dosage is 30 mg. Child's weight is 30 pounds.
   ______________ mg

NOTICE

In addition to the pretest items the student will be required to demonstrate mastery of the following objective.

OBJECTIVE 15

Determine correct action to follow when calculated results show unusual dosage results.

SCORE ____

INFORMATION SHEET

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 1

Identify the units in each measurement system used in pharmacology.

INTRODUCTION

In pharmacology today there are three systems of measurement —the metric system, the apothecary system and the household system. Each of these systems has units that are commonly used in the administration of medication.

Metric system

The metric system is based on the meter, which is one-millionth of the distance from the equator to the north pole. To determine the various types of measurements in this system, the meter is subdivided, grouped, cubed, and weighed. The meter is used as a measurement of distance and can be divided into one hundred parts called centimeters. If cubed, the centimeter becomes a cubic centimeter or a milliliter, which measures volume. A milliliter of pure water weighs one gram, and therefore grams are the metric measurement of weight.

METRIC UNITS
Used in Pharmacology and Medicine

Distance	Volume	Weight
centimeter (cm)	cubic centimeter (cc)	microgram (mcg)
meter (M)	(same as milliliter, ml)	milligram (mg)
	gram (G)	
	liter (L)	kilogram (kg)

Common metric prefixes

micro	= one millionth of a unit	0.000001
milli	= one thousandth of a unit	0.001
centi	= one hundredth of a unit	0.01
deci	= one tenth of a unit	0.1
deka	= ten units	10
hecto	= one hundred units	100
kilo	= one thousand units	1000

Because the metric system is based on the number ten, it is easy to see how each unit relates to the other units in this system. The examples below illustrate these relationships.

100 centimeters = 1 meter
1000 cubic centimeters or 1000 milliliters = 1 liter
1000 micrograms = 1 milligram
1000 milligrams = 1 gram
1000 grams = 1 kilogram

As you can see above, the prefixes used in the metric system units will actually describe to you how they relate in the system. For example, milli means one thousandth. Therefore, a milligram is one one-thousandth of a gram. Once you become familiar with these measurements, you will most likely prefer them because of their consistency in relation to one another.

Apothecary system

The oldest system of measurement used in pharmacology is the apothecary system. The standard of weight for this system is based on the weight of a grain of wheat.

The standard of volume in the apothecary system is based on the weight of water that is equal to the weight of one grain of wheat. This amount of water is the volume measurement of one minim. Because the apothecary system was developed only to be used with pharmacology, distance measurements are not present.

APOTHECARY UNITS	
Volume	**Weight**
minim (m, m_x)	grain (gr)
fluidram (fl dr, ʒ, fʒ)	dram (dr, ʒ)
fluidounce (fl oz, ℥, f℥)	ounce (oz, ℥)
pint (pt)	
quart (qt)	

Household system

The final system of measurement used in pharmacology is the household or English system which is familiar to most people. It uses Arabic numbers and units that are not as closely related or as consistent as the other two systems of measurement.

HOUSEHOLD UNITS		
Distance	**Volume**	**Weight**
inch (in)	drop (gtt)	ounce (oz)
foot (ft)	teaspoon (t, tsp)	pound (lb)
mile (mi)	tablespoon (T, tbsp)	
	cup (cu)	
	pint (pt)	
	quart (qt)	
	gallon (gal)	

OBJECTIVE 2

Distinguish between characteristics of each system of measurement.

Each of the systems of measurement has advantages and disadvantages. The metric system is presently considered the best to use in pharmacology because it is scientifically accurate. However, the metric system can be a problem because many people are still unfamiliar with it or do not have utensils for measuring metrically at home. The apothecary system, while accurate, is old and slowly phasing out. One of the greatest problems with its use is that the symbols are difficult to discriminate between, especially when handwritten. This difficulty can cause interpretation problems in transcription of orders. Finally, while the household system is the least accurate due to the differences in the manufacturing of utensils, it is still the most commonly used system at home because clients are familiar with its measurements.

NOTE: If the household system is used, precautions should be taken to inform clients to use measuring spoons and not flatware spoons.

ONCE AGAIN...

The advantages and disadvantages of each measurement system includes:

Advantages

- Metric—Most scientifically accurate measurements
- Apothecary—Accurate measurements
- Household—Clients are familiar with these measurements and have household measurement utensils for this system at home

Disadvantages

- Metric—Most people are unfamiliar with these measurements and do not have metric measurement utensils at home
- Apothecary—Difficult to discriminate between and transcribe symbols; old system that is phasing out
- Household—Least accurate system due to differences in manufacture of utensils

OBJECTIVE 3

Interpret verbal and written numbers.

Writing or rewriting words you have seen or heard may sound simple. However, interpreting a number incorrectly or writing a number incorrectly can be a very serious mistake when calculating medication dosages. For this reason, practical nurses must be able to interpret numbers with 100 percent accuracy. Complete accuracy is essential in order to understand dosages. To be accurate, a person working with dosages must understand all forms of numbers—whole numbers, fractions, decimals, etc. As a practical nurse using numbers for dosage calculations, you will be responsible for

- Writing numbers that you have heard
- Rewriting numbers in various forms
- Reading numbers that have been written

OBJECTIVE 4

Calculate using basic math skills: addition, subtraction, multiplication, and division.

Equality is a basic concept found in all the basic math skills. It is important to remember that an equal sign (=) indicates that the numbers on each side of the equal sign have the same meaning. An equal sign, therefore, indicates two equal statements. Several equal statements are listed in the examples below.

EXAMPLE: 1 + 1 = 2
3 - 1 = 2
1 x 2 = 2
4 - 2 = 2

If all of the statements to the left of the equal sign equal two, then all of the statements are equal to each other as well.

1 + 1 = 3 - 1 = 1 x 2 = 4 - 2 = 2

Addition

Addition is the process used to find the sum of several numbers when they are combined. In giving medications, you may be required to add two amounts together. The symbol used to indicate addition is the plus sign (+). Addition can be used to combine two or more numbers.

NOTE: When adding, it is helpful to place the numbers in columns instead of writing them across the page. Be sure to place each number in its correct position to avoid confusion when adding.

EXAMPLE: 672 + 12 + 3 + 1477 = 2164

$$\begin{array}{r} 672 \\ 12 \\ 3 \\ \underline{+\ 1477} \\ 2164 \end{array}$$

Subtraction

Subtraction is the process of determining the amount remaining when a specified amount is taken away from a number. Like addition, this skill is also used when determining dosage amounts or amounts of a medication available. The symbol used to indicate subtraction is the minus sign (-). In pharmacology, subtraction usually involves only two numbers.

Multiplication

Multiplication is the process of combining a number with itself a specified number of times. The symbol used to indicate multiplication is (x) or a dot (•). Another indication of multiplication that is understood is a number immediately preceding a number in parentheses, 8(3).

EXAMPLE: $2 \times 4 = 8$
$2 \cdot 4 = 8$
$2(4) = 8$

$$2 \times 4 = 2 \cdot 4 = 2\,(4) = 8$$

Division

Division is the process of separating a number into a specified number of equal portions. Although division is the most challenging of the basic math skills, it is frequently used in pharmacology. The symbols for division are (÷), ($\overline{)}$) and (/). Another indication of division is to place a number in fraction form or to place one number beside another number with a diagonal line between them.

EXAMPLES: $8 \div 2 = 4$
$2\overline{)8} = 4$
$\frac{8}{2} = 4$
$8/2 = 4$

$$8 \div 2 = 2\overline{)8} = \frac{8}{2} = 8/2 = 4$$

Before dividing a number, you must first determine which of the two numbers is the divisor. The divisor is the number in a division equation that divides a second number so many times. For example, if 3 were the divisor in 21/3, 21 would be divided into 3 parts of 7 each. To determine the divisor, read the equation aloud. For example, 21/3 would read "twenty-one divided by three." The number following "divided by" is always the divisor. Examples of how each division equation should be read are listed below.

EXAMPLES: $8 \div 2$ Eight divided by two

$2\overline{)8}$ Eight divided by two

$\frac{8}{2}$ Eight divided by two

8/2 Eight divided by two

OBJECTIVE 5 **Calculate using fractions.**

When calculating medication dosages, often you will have to use fractions. Once you have reviewed the steps in using fractions, you will be able to use them in calculation accurately and easily. The parts of a fraction and the different types of fractions are listed below.

Parts of a Fraction: $\frac{\text{numerator}}{\text{denominator}}$

Types of Fractions:

Proper fraction — Fraction with a numerator that is less than the denominator

EXAMPLES: 1/2, 3/7, 62/75

Improper fraction — Fractions with a numerator greater than or equal to the denominator

EXAMPLES: 3/2, 9/7, 100/75

NOTE: Any fraction with the same number in both the numerator and the denominator equals 1.

Mixed fraction — A whole number and a fraction

EXAMPLES: 1 1/2, 3 2/7, 100 1/75

Fraction stated in lowest terms — A mixed or proper fraction in which the numerator and the denominator cannot be divided by a common number

EXAMPLE: The fraction 4/6 can be reduced by dividing the numerator and the denominator by 2.

$$\frac{4 \text{ divided by } 2 = 2}{6 \text{ divided by } 2 = 3}$$

Now the fraction is stated in its lowest terms, 2/3. Both 4/6 and 2/3 represent the same amounts—2/3 just states the amount in the lowest terms.

Addition of fractions

Adding fractions may seem complicated, but once you understand the process involved, you will be able to solve these addition problems easily.

First, when adding fractions, all the denominators must be the same. Therefore, in order to add 2/3, 3/4, and 5/6 together, you will have to determine the lowest common denominator for these three fractions. The smallest number that all the denominators 3, 4, and 6 can be divided into is 12.

$$\frac{2}{3} + \frac{3}{4} + \frac{5}{6}$$

12/3 = 4

12/4 = 3

12/6 = 2

Now, change all the denominators in the fractions to 12. At the same time, multiply the numerators by the products listed above.

$$\frac{2}{3} \quad 12/3 = 4 \times 2 = \frac{8}{12}$$

$$\frac{3}{4} \quad 12/4 = 3 \times 3 = \frac{9}{12}$$

$$\frac{5}{6} \quad 12/6 = 2 \times 5 = \frac{10}{12}$$

Add the numerators of each fraction together. Do not add the denominators—they remain the same.

$$\frac{8}{12} + \frac{9}{12} + \frac{10}{12} = \frac{27}{12}$$

The last step involves reducing the denominator and the numerator to the lowest terms.

$$\frac{27 \text{ divided by } 3}{12 \text{ divided by } 3} = \frac{9}{4} = 2\ 1/4$$

Use the following steps to add fractions

1. Find the lowest common denominator (LCD) of all the fractions (the smallest number that is divisible by all of the denominators)
2. Change all fractions to the same denominator and adjust the numerators using the LCD
3. Add the numerators
4. Leave the denominators the same
5. Reduce to lowest terms

EXAMPLES: 1/3 + 1/5 = 5/15 + 3/15 = 8/15

3/4 + 3/10 = 15/20 + 6/20 = 21/20 = 1 1/20

Subtraction of fractions

Subtracting fractions is the same as adding fractions except you subtract the numerators instead of adding them

Use the following steps to subtract fractions

1. Find the lowest common denominator
2. Change all fractions to the same denominator using the LCD
3. Subtract the second numerator from the first
4. Reduce to lowest terms

EXAMPLES: 1/3 - 1/12 = 4/12 - 1/12 = 3/12 = 1/4

5/7 - 5/9 = 45/63 - 37/63 = 8/63

Multiplication of fractions

When multiplying fractions, you do not have to find the lowest common denominator as you do when adding and subtracting fractions. Instead, you simply multiply the numerators and multiply the denominators to find the product.

Before multiplying fractions, you should reduce each fraction to its lowest form. For example, before multiplying 3/12 x 5/20, reduce each fraction as shown below.

$$\frac{3 \text{ divided by } 3}{12 \text{ divided by } 3} = \frac{1}{4}$$

$$\frac{5 \text{ divided by } 5}{20 \text{ divided by } 5} = \frac{1}{4}$$

Use the following steps to multiply fractions.

1. Multiply numerators
2. Multiply denominators
3. Can reduce numerators and denominators before multiplication

EXAMPLES: 2/3 x 1/4 = 2/12 = 1/6

4/7 x 14/15 = 4/1 x 2/15 = 8/15

Division of fractions

Dividing fractions is very easy once you know the trick. Simply invert or flip the second fraction, and then multiply the two fractions together.

$$\frac{2}{3} \text{ divided by } \frac{3}{4}$$

$$\frac{2}{3} \times \frac{4}{3} = \frac{8}{9}$$

Use the following steps to divide fractions.

1. Invert the second fraction (switch numerator and denominator)
2. Multiply

EXAMPLES: 1/2 1/3 = 1/2 x 3/1 = 3/2 = 1 1/2

2 2/5 7/9 = 12/5 x 9/7 = 108/35 = 3 3/35

OBJECTIVE 6

Calculate using decimals.

In pharmacology, there is an ever increasing use of the metric system and, therefore, an increase in the use of decimals. Decimals are a continuation of the tens system in Arabic numbers. Like whole numbers, each decimal column has a value, and each column can contain numbers ranging from 0-9. **For clarification, decimal numbers that are not part of a whole number should always have a zero placed to the left of the decimal (0.92).** The chart below shows the value of each decimal place.

1.	one
0.1	one tenth
0.01	one one-hundreth
0.001	one one-thousandth
0.0001	one ten-thousandth

Addition of decimals

Adding decimals is the same as adding whole numbers. Be sure to place each number in its correct column and place all decimals one above the other.

EXAMPLE: 12.34 + 0.033 + 146.9 = 159.273

$$\begin{array}{r} 12.34 \\ 0.033 \\ +\ 146.9 \\ \hline 159.273 \end{array}$$

NOTE: If necessary, zeros may be added to the right of a number to hold additional places. For example, 12.34 could be written 12.340 in order to have the same number of places as the number following it, 0.033.

Subtraction of decimals

When subtracting using decimals, it is important to keep the numbers in their correct columns. You should also place zeros where necessary to hold column places.

EXAMPLE: 1.8 - 0.075 = 1.725

$$\begin{array}{r} 1.800 \\ \underline{-\ 0.075} \\ 1.725 \end{array}$$

Multiplication of decimals

Multiplying decimals involves the same process as multiplying whole numbers, plus one additional step. Once the numbers have been multiplied, you can then complete the additional step. First, add the number of decimal places in the numbers being multiplied. Then, in your answer, place the decimal point that many places to the left of the end of the number.

EXAMPLE: 2.35 x 1.03 = 2.4205

Four decimal places can be found in the two numbers being multiplied above. Therefore, the decimal is placed to the left of the fourth number from the end of the answer.

Division of decimals

To divide decimal numbers, you must set up the numbers using the long division sign. Once the numbers have been set up in this format, you will have to remove the decimals from the divisor, the number to the left of the long division sign. If the divisor contains decimals, move the decimal to the right as many columns as necessary to remove the decimal from the number. Then, move the decimal in the dividend (the number under the long division sign) the same number of columns to the right. Once you have moved this decimal in the dividend, write a decimal point immediately above it in the answer space. This will insure that you don't forget to place the decimal in your answer.

EXAMPLE: $2.36 \div 0.4$

$0.4\overline{)\,2.36}$

$$\begin{array}{r} 5.9 \\ 4\overline{)23.6} \\ \underline{20} \\ 36 \\ \underline{36} \\ 0 \end{array} = 5.9$$

If a smaller number is being divided by a larger number, move the decimal as shown above, and use zeros to hold the place.

EXAMPLE: $0.035 \div 0.7$

$0.7\overline{)\,0.035}$

$7\overline{)0.35} = 0.05$

OBJECTIVE 7 **Calculate ratios and proportions.**

Most methods of calculating dosage require the use of ratio and proportion. A ratio is a statement of the relationship between two factors.

A ratio and proportion problem is set up in the following formula.

a : b :: known a : unknown b

The ratio "a : b" on the left side of :: is the known ratio in the proportion statement. This is a ratio that we know to be true. For example, 12 inches are in 1 foot, 4 quarts are in 1 gallon, and 100 centimeters is in one meter.

The ratio "known a : unknown b""is the unknown ratio in the proportion statement. You will be given the "known ratio" and will have to determine the "unknown ratio." For example, you may want to know how many inches are in 5 feet. Set up and solve proportions as shown in the following example. **Be sure that "a" and "known a" have the same measurement units, and that "b" and "unknown b" have the same measurement units.**

1. Determine the "known ratio", a : b.

   1 foot : 12 inches

2. Set up the proportion. Both a's and both b's should have the same units of measurement.

   $$\underbrace{1\text{ foot} : \underbrace{12\text{ inches} : : 5\text{ feet}}_{\text{means}} : \text{unknown inches}}_{\text{extremes}}$$

3. Multiply the means—the two inner numbers, 12 inches and 5 feet.

   12 x 5 = 60

4. Multiply the extremes—the two outer numbers, 1 foot and b inches.

   1 x b = 1b

5. Set the two products equal to each other.

   1b = 60

6. Divide b and 60 by the number preceding b to obtain the answer.

   60 divided by 1 = 60 inches

Additional examples of using ratio and proportion are listed below.

EXAMPLES: There are always 4 quarts in a gallon. This is a constant or known ratio. It may be stated as 4 qts : 1 gallon or as 1 gallon : 4 qts. Either statement means the same. Whether the substance being measured is skim milk, buttermilk or water, these measurements and their relationship to one another remain the same. They do not change.

To illustrate how proportions can help you determine an unknown factor, we will use an example involving milk and milk cartons. You have 7 gallons of milk on hand and need several cartons to package it. How many quart-size cartons will it take to hold the milk?

The known ratio is 1 gallon : 4 quarts

The proportion is set up to read 1 gallon is to 4 quarts as 7 gallons are to how many quarts?

1 gal : 4 qt :: 7 gal : x qt

Multiply the means — 4 x 7

Multiply the extremes — 1 x X

Set these two products equal to one another

28 = 1x

28 quart containers are needed to hold the liquid.

What if there are 72 quarts on hand and you needed to determine the number of gallons necessary to fill the containers? The same procedure can be followed.

4 qt : 1 gal [illegible] qt : x gal

Means 72 = 4x (divide each side by 4)

18 = x

18 gallons of milk are needed to fill the containers.

OBJECTIVE 8

Read and write apothecary Roman numerals.

The apothecary system was developed several hundred years ago, and uses an older set of numbers than the ones we typically use today. This older set of numbers is Roman numerals. You should be familiar with the Arabic numbers (such as 1, 2, 3) which are used in the metric and household measurement systems. However, to be proficient in all aspects of medication dosage, the ability to recognize and use Roman numerals is necessary. Once you have used the Roman numerals in the apothecary system, you will find that it is not difficult. The exercises below will give you the practice necessary to become comfortable with the Roman numerals and their use in the apothecary system.

Roman Numerals used with apothecary dosages

ss = 1/2 (Other fractions are expressed with Arabic numerals.)

I or i = 1

V or v = 5

X or x = 10 (Don't confuse this symbol with an unknown number)

Rules for using Roman numerals

1. Always consider Roman numerals in groups
2. Read the numbers from left to right
3. When a smaller number follows a larger number, add the two numbers together

   EXAMPLE: VII = V(5) + II(2) = 7

4. When a smaller number precedes a larger number, subtract the smaller number from the larger one

   EXAMPLE: IV = V(5) - I(1) = 4

5. The maximum number of like symbols in a row, is three

   EXAMPLE: VIII = 8

The apothecary system has quite a few idiosyncrasies, including its use of Roman numerals. Some guidelines on the use of Roman numerals in the apothecary system are listed below.

1. Roman numerals above 15 are now expressed with Arabic numerals.
2. Any time a Roman numeral is used, it should be placed after the unit of measurement. However, when Arabic numerals are used, they should be placed before the unit of measurement.

   EXAMPLES: gr v, 30 gr.

OBJECTIVE 9

Determine equivalents among the three systems of measurement.

Often, charts are used to help determine equivalents. In order to give the correct amount of medication, you must be able to read the equivalent chart correctly. The following chart shows measurements that are equal in the three different systems. Usually charts are available in the work place, or they can be purchased for personal use. The measurement equivalents found in bold type should be memorized because you will be using them frequently. Measurements found on the same line are equal.

Approximate equivalent measures of fluids and weight

	METRIC	APOTHECARY	HOUSEHOLD
	0.060 ml	**m i**	**1 gtt**
	1 ml = 1cc	m xv (15 m)	15 gtt
F	5 ml (4)	**1 fl. dr, f**	**1 tsp**
L	15 ml	3 f	1 tbsp
U	30 ml	1 fld oz	2 tbsp (1/8 c)
I	250 ml (240)	8 fld oz	1 cup or glass
D	500 ml	16 fld oz	1 pt
	1000 ml = 1L	32 fld oz	1 qt
	4 L	128 fld oz	1 gal
	0.4 mg	gr 1/150	
	1 mg	gr 1/60	
W	0.060 G = **60 mg**	**gr i**	
E	0.5 G = 500 mg	gr viiss (7 1/2 gr)	1/8 tsp
I	1 G = 1000 mg	**gr xv (15 gr)**	1/4 tsp
G	4 G = 4000 mg	60 gr = 1 dr	1 tsp
H	15 G	4 dr	1 tbsp
T	30 G	1 oz	2 tbsp
	0.455 Kg	12 oz	1 lb
	1 Kg		**2.2 lb**

OBJECTIVE 10

Convert medication dosages from one unit of measurement to another unit of measurement.

Conversion is a method of changing one unit of measurement into an equal amount of a different unit of measurement. Medication orders may differ in units from those available in the pharmacy. With the use of conversion, the correct amount of medication for administration can be determined. Although there are several ways to convert equivalents, the method you use must be memorized because you will be using it often and many times without the aid of resources containing the formula. One of the common methods for determining an unknown equivalent is ratio and proportion, shown in the following formula.

FORMULA

Known unit of measure : Known equivalent :: Desired unit of measure : Unknown equivalent

Examples explaining the use of this formula are included in the following sections of this information sheet.

Converting metric units to household units

The following example illustrates the use of ratio and proportion when converting metric units to household units.

EXAMPLE: A person has 10 ml of cough syrup ordered and needs to know how many tsp to take for home use.

First of all, you know that the desired unit of measure that the person wants to take is 10 ml.

Known Unit of Measure : Known Equivalent :: 10 ml : Unknown Equivalent

You also know that the desired unit is in ml and that the person wants to take an equivalent amount in tsp. Therefore, 1 tsp is the known equivalent.

Known Unit of Measure : 1 tsp :: 10 ml : Unknown Equivalent

To determine the known unit of measure, which is the unit measurement of ml that is equal to 1 tsp, you must check an equivalents table. An equivalents table is provided on the preceeding page of Supplement 5 in this unit. If you were to check this table, you would find that 1 tsp is equal to 5 ml. Therefore, the known unit of measure is 5 ml.

Now we know all three units except the unknown equivalent.

$$\underbrace{5\text{ ml} : \underbrace{1\text{ tsp} :: 10\text{ ml}}_{\text{means}} : x\text{ tsp}}_{\text{extremes}}$$

Once you reach this point, you must define the two inner units, called means, and the two outer units, called extremes. The means and extremes are illustrated and defined above.

First, multiply the means together — 1 tsp x 10 ml = 10.

Now, multiply the extremes together — 5 ml x X tsp = 5X

Finally, set the two products equal to each other.

$$5X = 10$$

To arrive at the final answer, divide both sides by 5.

$$X = 2$$

Converting between metric units and apothecary units

One of the most common conversions is from grams to grains or vice versa. For this, use the ratio and proportion formula as follows.

EXAMPLES:

Grams to grains—If 3 G of a medication is to be converted:

$$\begin{aligned} 1\ G : 15\ gr &:: 3\ G : x\ gr \\ 1x &= 45 \\ x &= 45\ gr \end{aligned}$$

Grains to grams—If 10 gr of a medications is to be converted:

$$\begin{aligned} 15\ gr : 1\ G &:: 10\ gr : x\ G \\ 15x &= 10 \\ x &= 0.666\ G \end{aligned}$$

Remember, all metric amounts are stated in decimal form. For practical reasons, this amount would be converted to and referred to as 650 mg. (1000 mg are in one gram.)

NOTE: You are allowed a 10% margin of difference when converting from one system of measurement to another.

Converting within the metric system

Within the metric system, you can either use the previous formula or simply move decimals to obtain a quick, accurate conversion.

The conversion between grams and milligrams, or any measurement in the metric system, can be completed using one simple step. Because there are 1000 milligrams in 1 gram, all you will need to do is change the position of the decimal point when converting from one unit to the other.

To convert milligrams to grams, move the decimal point three places to the left. Remember, if no decimal is stated, the number is a whole number and the decimal is understood to follow on the far right side of the number.

EXAMPLE: Change 2500 milligrams to grams

2500 mg = ? G
2500 mg = 2.5 G

To convert grams to milligrams, move the decimal point three places to the right.

EXAMPLE: Change 0.5 grams to milligrams

0.5 G = ? mg

0.500 G = 500 mg

Converting between apothecary and metric units

Because the apothecary system is still being used to write orders, while most medications are labeled using the metric system, you must be able to convert measurements between the two systems when calculating dosage amounts. In order to double check your work, you must be able to work from metric to apothecary, as well as from apothecary to metric.

OBJECTIVE 11

Determine the necessary information for dosage calculation.

One critical ability of the nurse is to accurately calculate medication dosages from orders. Errors in calculating can be harmful to the patient and are also a great liability to you, the nurse. You must be able to determine the information necessary to calculate the amount of a medication that is to be given to a client. The necessary information includes

- The dosage ordered
- The dose on hand
- The quantity on hand

The dosage ordered is usually a weight indicating the amount of medication being given—this information is provided in the physician's order.

The dose on hand is a measurement indicating the amount of medication in each dose. The dose on hand is located on the medication label. If the units on the label and the units on the dosage ordered are different, you will need to convert between the systems.

The quantity on hand is the form of the medication, such as tablets or a liquid measurement. This information can also be found on the medication label. Note that quantity on hand does not mean the total number of dosages available—instead, it indicates how many doses are needed to hold the dosage ordered.

To identify these parts, read the following example of an order and a label.

Order: Give Aspirin 650 mg every 4 hours as needed for headache.

Label: Aspirin 325 mg per tablet.

In this example, the dosage ordered is 650 mg, the dose on hand is 325 mg, and the quantity on hand is 1 tablet.

ONCE AGAIN...

The necessary information for dosage calculation includes

- **Dosage ordered** — Weight indicating the amount of medication being given; located in physician's order
- **Dose on hand** — Measurement of the amount of medication per dose; located on medication label
- **Quantity on hand** — Form of the medication containing the dosage amount; located on medication label

OBJECTIVE 12 **Use one method of dosage calculation.**

After determining the dosage ordered and the dosage on hand, the nurse should perform any conversion necessary. In this procedure, you should convert the dosage ordered units to the dosage on hand units. This may prevent confusion when setting up the complete dosage calculation later. **When calculating dosages, always double check the conversion before using the result.**

Several accurate formulas for calculating dosages are available. In this unit, the following formula will be used.

$$\frac{\text{Dosage ordered}}{\text{Dose on hand}} \times \text{Quantity on hand} = \text{Amount Desired}$$

Order: Give Aspirin 650 mg every 4 hours as needed for headache

Label: Aspirin 325 mg per tablet

EXAMPLE: $\frac{650\text{ mg}}{325\text{ mg}} \times 1\text{ tab} = Y\text{ tab}$

$2 \times 1 = 2\text{ tab}$

After solving an equation, always check the "reasonableness" of your answer. If your dosage answer is less than 1/2 tablet or more than 2 tablets, or if an injection calculation is less than 1/2 cc or more than 3 cc, have someone double check your answer.

Today, dosage calculation is needed less frequently than in the past. However, its importance in practical nursing has not decreased. While it is not a skill that is used every day, dosage calculation is one that must be performed with complete accuracy when needed. Every practical nurse must gain absolute proficiency with this skill.

OBJECTIVE 13

Calculate medication dosages proportionate to body weight.

Although many medications remain standardized for a 150 lb adult, other medications are being developed to meet the needs of the individual according to his body weight. Because the dosages are specialized for an individual's weight, calculating is necessary to determine the exact dosage amount to be given. To calculate specific dosage amounts, you must use the metric weight measurement of kilograms. The use of kilograms is necessary because medications are usually ordered by milligrams per kilogram of body weight.

To calculate a dosage that is proportionate to an individual's body weight, you must first determine the number of milligrams of medication required per kilogram of body weight. This information is stated on the medication label. Then the client's weight must be determined in kilograms. If the client's pound weight is known, it may be converted to kilograms using the equivalent 2.2 lbs = 1 kg. The following formula can then be used to calculate a dosage that is proportionate to a client's body weight.

FORMULA:

Label (mg/kg) x patient kg weight = dosage

EXAMPLE: **A medication label states that 10 mg of medication should be given to a client for every kilogram of the client's total weight. The client weighs 60 kg. What dosage should the client be given?**

$$\frac{10\text{ mg}}{1\text{ kg}} \times 60\text{ kg} = 600\text{ mg}$$

Generally, this method of calculation is used to determine a daily dosage of a medication, which may then be divided into a specified number of doses.

For example, if a medication were calculated on 2 mg/kg of weight for the daily dose and the person weighed 30 kg, the total dosage would be 60 mg per day. If this were divided into two doses during the day, each dose would be 30 mg.

This may be shown as follows:

FORMULA: $\frac{\text{mg}}{\text{kg}} \times$ person's weight in kg = dosage

$$\frac{2\text{ mg}}{1\text{ kg}} \times 30\text{ kg} = 60\text{ mg}$$

Then divide 60 mg by 2 = 60 — 2 = 30 mg

OBJECTIVE 14 **Calculate medication dosages for infants and children using Clark's rule.**

Accuracy is even more important when dealing with infants and children because small amounts of medication can have drastic effects on their small bodies. Although several methods are available for calculating dosages for infants and children, the method used below, Clark's Rule, is based on the child's weight. Many people prefer this formula because it is accurate and does not require any special charts for body surface measurement.

Clark's Rule Formula

$$\frac{\text{child's weight in pounds}}{150} \times \text{adult dose} = \text{child's dose}$$

This formula uses 150 as a divisor because 150 lbs is considered the average adult weight used for adult medication preparation. Also, this formula uses a child's weight rather than a child's age as the varying factor. Because the formula is based on a child's weight, the child who is smaller or larger than average for his age will receive the proper dosage necessary for his body size.

EXAMPLE: The adult dosage of a medication is 100 mg. What dosage should a 30 lb. child receive?

$$\frac{30 \text{ lb}}{150 \text{ lb}} \times 100 \text{ mg} = 20 \text{ mg}$$

NOTE: If you are working with pediatric medicine, you should become familiar with the method of calculation used in the facility.

Apply conversions between systems to common objects

To help you understand measurements in the metric, apothecary, and household system. Examples are provided of these measurements that you are familiar with in day-to-day life.

1. Just a spoon full of sugar . . .

   The teaspoon of sugar that some people put in coffee could be divided into sixty equal parts to show the size of an apothecary grain. To show the size of a milligram, you would then have to divide one of those sixty parts into sixty parts again!

2. A normal can of carbonated beverage has 354 ml (360), or 12 fld. oz.

3. A quarter pound burger weighs about 100 grams, or 3 oz (before being cooked).

4. One grain of wheat sets the standard for the apothecary grain.

   A. For practice, determine equivalents for the following common weights and measures.

      1. An old saying says "a pint is a pound the world around" but how many grams is that?

         ____

      2. How many drops or minims are in a teaspoon of water?

         ____

      3. In pharmacology, the average adult weighs 150 pounds—how many kilograms is that?

         ____

      4. A restaurant will give you a free dinner if you can eat a 72 oz. steak dinner in an hour. How many pounds is that?

         ____

Alternate methods of converting units of measurement

Several other methods can be used to convert dosage amounts from one unit of measurement to another.

A. Fractional Methods

1. Cross multiply and solve to determine the unknown using the following equation.

$$\frac{\text{Known unit of measure}}{\text{Known equivalent}} = \frac{\text{Desired unit of measure}}{\text{Unknown equivalent}}$$

EXAMPLE: A person has been told to take 10 ml of cough syrup. How many tsp should the person take for home use?

$$\frac{5 \text{ ml}}{1 \text{ tsp}} = \frac{10}{x}$$

$$5x = 10$$

$$x = 2$$

2. Cross multiply and solve to determine the unknown using the following equation.

$$\frac{\text{Known unit of measure}}{\text{Desired unit of measure}} = \frac{\text{Known equivalent}}{\text{Unknown equivalent}}$$

EXAMPLE: A person has been told to take 10 ml of cough syrup. How many tsp should the person take for home use?

$$\frac{5 \text{ ml}}{10 \text{ ml}} = \frac{1 \text{ tsp}}{x \text{ tsp}}$$

$$5x = 10$$
$$x = 2$$

3. Cross multiply and solve to determine the unknown using the following equation.

$$\frac{\text{Desired unit of measure}}{\text{Known unit of measure}} = \frac{\text{Unknown equivalent}}{\text{Known equivalent}}$$

EXAMPLE: A person has been told to take 10 ml of cough syrup. How many tsp should the person take for home use?

$$\frac{10 \text{ ml}}{5 \text{ ml}} = \frac{x \text{ tsp}}{1 \text{ tsp}}$$

$$2 = x$$

B. Formula method

$$\frac{\text{Desired unit of measure}}{\text{Known unit of measure}} \times \text{Known equivalent} = \text{Unknown Equivalent}$$

EXAMPLE: A person has been told to take 10 ml of cough syrup. How many tsp should the person take for home use?

$$\frac{10 \text{ ml}}{5 \text{ ml}} \times 1 \text{ tsp} = x \text{ tsp}$$

$$2 \times 1 = x$$

$$2 = x$$

Alternate methods of calculating dosages

A. Use the fractional methods of converting units, listed in Supplement 2, and substitute as follows.

Known unit of measure = **Dose on hand**
Known equivalent = **Known quantity**
Desired unit of measure = **Dose ordered**
Unknown equivalent = **Unknown quantity**

1. $$\frac{\text{Dose on hand}}{\text{Known quantity}} = \frac{\text{Dose ordered}}{\text{Unknown quantity}}$$

2. $$\frac{\text{Dose on hand}}{\text{Dose ordered}} = \frac{\text{Known quantity}}{\text{Unknown quantity}}$$

3. $$\frac{\text{Dose ordered}}{\text{Dose on hand}} = \frac{\text{Unknown quantity}}{\text{Known quantity}}$$

B. Another method that uses fractions to determine dosages is as follows:

1. Invert the on hand amount

2. Multiply by the ordered dose

   A patient is ordered to receive 45 mg of a medication and the dose on hand reads 60 mg/2cc.

   $$\frac{2\text{ cc}}{60\text{ mg}} \times 45\text{ mg} = \frac{90}{60} = 1\ 1/2\text{ cc}$$

3. This method can also be used as follows:

   a. Invert the on hand dose

   b. Multiply by the ordered dose

   c. Multiply the known quantity

   $$\frac{1}{60\text{ mg}} \times \frac{45\text{ mg}}{1} \times \frac{2\text{cc}}{1} = \frac{90}{60} = 1\ 1/2\text{ cc}$$

NOTE: Always include the known quantity, even though it is one, because it is easily forgotten if not used consistently.

The key to finding the right method of calculation is to use one that you can remember and that can be used consistently to calculate accurately.

Alternate method for calculation of pediatric dosages.

The following methods may be used to calculate pediatric doses. Each must be checked for accuracy when used and should be used only if approved by the agency or facility. Most pediatric doses are now calculated by mg/kg of body weight or specified by the physician.

A. Formulas Using Age

1. Fried's rule

$$\frac{\text{Age (in months)}}{150} \times \text{adult dose} = \text{infant dose}$$

2. Young's rule

$$\frac{\text{Age of child (in years)}}{\text{Age of child} + 12} \times \text{adult dose} = \text{child's dose}$$

3. Dilling's rule

$$\frac{\text{Age (in years)}}{20} \times \text{adult dose} = \text{child's dose}$$

4. Cowling's rule

$$\frac{\text{Age (on next birthday)}}{24} \times \text{adult dose} = \text{child's dose}$$

5. Bastedo's rule

$$\frac{\text{Age in years} + 3}{30} \times \text{adult dose} = \text{child's dose}$$

B. The most accurate method available is the use of body surface area, the nomogram, and a formula. A straight line is drawn from the patient's height to the patient's weight. Where these two intersect is used to determine body surface area (BSA). This is then put into the following formula.

$$\frac{\text{BSA of child (m2)}}{\text{1.7 (m2)}} \times \text{adult dose} = \text{child's dose}$$

	METRIC	APOTHECARY	HOUSEHOLD
	0.060 ml	**m i**	**1 gtt**
	1 ml = 1cc	m xv (15 m)	15 gtt
F	5 ml (4)	**1 fl. dr, f**	**1 tsp**
L	15 ml	3 f	1 tbsp
U	30 ml	1 fld oz	2 tbsp (1/8 c)
I	250 ml (240)	8 fld oz	1 cup or glass
D	500 ml	16 fld oz	1 pt
	1000 ml = 1L	32 fld oz	1 qt
	4 L	128 fld oz	1 gal
	0.4 mg	gr 1/150	
	1 mg	gr 1/60	
W	0.060 G = **60 mg**	**gr i**	
E	0.5 G = 500 mg	gr viiss (7 1/2 gr)	1/8 tsp
I	1 G = 1000 mg	**gr xv (15 gr)**	1/4 tsp
G	4 G = 4000 mg	60 gr = 1 dr	1 tsp
H	15 G	4 dr	1 tbsp
T	30 G	1 oz	2 tbsp
	0.455 Kg	12 oz	1 lb
	1 Kg		**2.2 lb**

ACTIVITY SHEET 1	CALCULATE MEDICATION DOSAGE

OBJECTIVE 3 **Interpret verbal and written numbers.**

DIRECTIONS The exercises below will allow you to practice interpreting written and spoken numbers and obtain an accurate understanding of the many forms of numbers.

1. Listen to the numbers being read aloud and write them in Arabic numeral form (1, 2, 3). Your instructor will read the numbers, or the numbers will be played from a prerecorded tape.

a. ____________ f. ____________

b. ____________ g. ____________

c. ____________ h. ____________

d. ____________ i. ____________

e. ____________ j. ____________

2. Copy the following numbers exactly as you see them.

a. 843 ____________ f. 51/58 ____________

b. 34892 ____________ g. 9.012 ____________

c. 660,000 ____________ h. 0.0138 ____________

d. 22 1/8 ____________ i. 101.05 ____________

e. 1 1/125 ____________ j. 1,000,005.33 ____________

3. Read the above numbers aloud when directed by instructor.

4. Write the following numbers out in word form.

a. 932 ____________________________

b. 340,029 ____________________________

c. 29 1/2 ____________________________

d. 0.058 ____________________________

e. 2,016,203.92 ____________________________

ACTIVITY SHEET 2

CALCULATE MEDICATION DOSAGE

OBJECTIVE 4

Calcualte using basic math skills: addition, subtraction, multiplication, and division.

DIRECTIONS

This activity sheet is a brief review of and practice of the basic math skills. These skills must be mastered with complete accuracy to insure correct dosage calculation and to insure patient safety. If any of the following math skills are difficult for you, seek help from your instructor.

1. Complete the following addition problems. You may want to write the numbers in column form to calculate the answers.

   a. 4 + 9 = ____________________

   b. 32 + 18 = ____________________

   c. 315 + 327 = ____________________

   d. 4813 + 311 = ____________________

   e. 97 + 83 + 16 = ____________________

   f. 114 + 654 + 3 = ____________________

   g. 65 + 892 + 9 = ____________________

   h 1,001,899 + 300,103 = ____________________

2. Complete the following subtraction problems.

   a. 14 - 8 = ____________________

   b. 58 - 23 = ____________________

   c. 872 - 735 = ____________________

   d. 903 - 89 = ____________________

   e 1433 - 752 = ____________________

   f. 6645 - 1205 = ____________________

   g. 24030 - 893 = ____________________

   h. 600,000 - 320,000 = ____________________

3. Complete the following multiplication exercises.

   a. 8 x 3 = ____________________

   b. 22 x 7 = ____________________

   c. 31 x 13 = ____________________

   d. 84 · 66 = ____________________

   e. 101 · 5 = ____________________

   f. 390(58) = ____________________

   g 2260(43) = ____________________

   h. 893 x 641 = ____________________

4. Complete the following division problems.

   a. 14 ÷ 2 = ____________________

   b. 32/4 = ____________________

   c. 55 ÷ 11 = ____________________

   d. 645 ÷ 15 = ____________________

   e. 888/37 = ____________________

   f. 2499 ÷ 21 = ____________________

   g. $82\overline{)656}$ = ____________________

   h. $56\overline{)30688}$ = ____________________

ACTIVITY SHEET 3

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 5 **Calculate using fractions.**

DIRECTIONS Calculate the following fractions and write the answer in the blanks. Show your work on scratch paper.

1. Practice reducing the following fractions to the lowest terms.

   a. 3/12 = ____________
   b. 7/21 = ____________
   c. 12/16 = ____________
   d. 44/121 = ____________
   e. 150/1000 = ____________
   f. 255/100 = ____________

2. Complete the following problems involving the addition of fractions.

   a. 1/2 + 1/4 = ____________
   b. 2/3 + 1/9 = ____________
   c. 3/8 + 5/12 = ____________
   d. 1/2 + 5/13 = ____________
   e. 1/2 + 1/3 + 1/4 = ____________
   f. 1/3 + 2/7 + 5/9 = ____________
   g. 18/5 + 3/4 + 1/2 = ____________
   h. 3 3/4 + 2 5/6 = ____________

3. Complete the following problems involving the subtraction of fractions.

   a. 1/5 - 1/6 = ____________
   b. 8/9 - 2/3 = ____________
   c. 12/15 - 3/10 = ____________
   d. 18/24 - 3/8 = ____________
   e. 9/8 - 5/6 = ____________

f. 2 1/2 - 1 3/4 = ____________________

g. 18 1/13 - 5 1/2 = ____________________

h. 87/100 - 300/1000 = ____________________

4. Complete the following problems involving the multiplication of fractions.

a. 1/4 x 3/7 = ____________________

b. 6/6 x 10/13 = ____________________

c. 2/3 x 6/9 = ____________________

d. 4/5 x 7/12 = ____________________

e. 1 1/2 x 2/3 = ____________________

f. 2 x 3/10 = ____________________

g. 15/3 x 90/125 = ____________________

h. 50/2 x 1/10 = ____________________

5. Complete the following problems involving the division of fractions.

a. 1/8 ÷ 1/4 = ____________________

b. 2/6 ÷ 8/9 = ____________________

c. 5/12 ÷ 1/3 = ____________________

d. 9/10 ÷ 7/7 = ____________________

e. 8/3 ÷ 3/5 = ____________________

f. 24/25 ÷ 3/100 = ____________________

g. 4 5/6 ÷ 1/2 = ____________________

h. 6 6/10 ÷ 1/3 = ____________________

ACTIVITY SHEET 4

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 6 **Calculate using decimals.**

DIRECTIONS Calculate the following decimals and write the answer in the blanks. Show your work on scratch paper and turn it in with the activity sheet.

1. Practice adding numbers containing decimals by solving the equations below.

   a. 2.1 + 0.8 = ____________

   b. 0.39 + 0.7 = ____________

   c. 1.47 + 0.04 = ____________

   d. 3.082 + 6.524 = ____________

   e. 0.052 + 0.8 + 0.13 = ____________

   f. 1.33 + 5.5 + 3.915 = ____________

   g. 0.00872 + 1.993 = ____________

   h. 0.844 + 92 + 0.33 + 1.1 = ____________

2. Practice subtracting numbers containing decimals by solving the equations below.

   a. 3.6 - 1.2 = ____________

   b. 22.5 - 0.75 = ____________

   c. 18.899 - 1.1 = ____________

   d. 0.052 - 0.04 = ____________

   e. 100 - 0.001 = ____________

   f. 2 - 1.54 = ____________

   g. 1.005 - 0.984 = ____________

   h. 0.1 - 0.0006 = ____________

3. **Practice multiplying numbers containing decimals by solving the equations below.**

   a. 2.2 x 3 = ________________

   b. 0.5 x 1.9 = ________________

   c. 0.01 x 0.3 = ________________

   d. 1.1 x 0.54 = ________________

   e. 1.36 x 0.55 = ________________

   f. 0.483 x 0.3 = ________________

   g. 0.111 x 1.09 = ________________

   h. 300.1 x 0.0687 = ________________

4. **Practice dividing numbers containing decimals by solving the equations below.**

   a. 8 ÷ 0.2 = ________________

   b. 0.6 ÷ 0.03 = ________________

   c. 1.8 ÷ 0.25 = ________________

   d. 0.88 ÷ 0.11 = ________________

   e. 1.5 ÷ 0.5 = ________________

   f. 0.63 ÷ 1.5 = ________________

   g. 74.5 ÷ 80 = ________________

   h. 0.0529 ÷ 0.23 = ________________

ACTIVITY SHEET 5

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 7 **Calculate ratios and proportions.**

DIRECTIONS

1. Practice ratio and proportions by completing the following exercises.

a. 2 cups : 1 pt :: 7 cups : x pt ____________________ pt

b. 12 inches : 1 foot :: 60 in : x ft _________________ ft

c. 1 kilogram : 2.2 pounds :: 44 kg : x lb __________ lb

d. 1000 milliliters : 1 quart :: 4500 ml : x qt ________ qt

e. 1 hour : 60 minutes :: x hours : 75 min __________ hr

f. A person is jogging for health. The person's average mile takes about 10 minutes to jog.

1) How much time will it take to jog 3 miles? _________

2) How many miles could the person jog in 45 minutes?

____

g. A person is on a special balanced diet. For every 12 grams of protein the person consumes, he is to eat 25 grams of fat.

1) How many grams of fat should be eaten during a day when 36 grams of protein are eaten? ______________

2) How much protein should be eaten if the person eats 45 grams of fat? ____________________________

h. A person is on a calorie reduction diet to lose weight. To lose a pound, the person must decrease their total caloric intake by 3000.

1) If the person had been eating 2200 calories per day and started eating 1200 calories how long would it take the person to lose 5 pounds? _______________

2) If the person decreased from 2200 calories per day to 1000 calories, how much weight would be lost in 10 days? ____

CALCULATE MEDICATION DOSAGE

OBJECTIVE 8 **Read and write apothecary Roman numerals.**

DIRECTIONS Complete the following exercises as directed and write the answers in the blanks.

1. Write the following Roman Numerals in Arabic Numerals.

   a. III = ____________________

   b. ii = ____________________

   c. iv = ____________________

   d. xiii = ____________________

   e. xiv = ____________________

   f. iss = ____________________

2. Convert the following numbers to Roman Numerals.

   a. 2 1/2 = ____________________

   b. 6 = ____________________

   c. 9 = ____________________

   d. 12 = ____________________

   e. 8 1/2 = ____________________

   f. 11 1/2 = ____________________

3. Rewrite the following numbers in word form.

   a. gr ii = ____________________ ____________

   b. dr iss = ________________________________

   c. 60 m = ________________________________

   d. gr viiss = ________________________________

   e. 3 1/4 oz = ________________________________

4. Using the rules listed in the information sheets and the abbreviations or symbols appropriate for the apothecary system, write the following apothecary measurements correctly.

   a. Three grains = ______________________________

   b. Fifteen minims = ___________________________

   c. Sixty drops = ______________________________

   d. Four and one-half ounces = __________________

   e. One one-hundred-fiftieth grain = _____________

   f. Four drams = ______________________________

   g. Two and one-fourth ounces = _______________

   h. Twenty and one half grains = _______________

ACTIVITY SHEET 7

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 9 **Determine equivalents among the three systems of measurement.**

DIRECTIONS Use the chart found in Supplement 5 to determine equivalents among the three systems of measurement.

1. 1 ml = ________________ gtt
2. 30 ml = ________________ oz
3. 8 oz = ________________ c
4. 1 qt = ________________ L
5. gr i = ________________ mg
6. 1 G = ________________ gr
7. 2.2 lb = ________________ Kg
8. 250 ml = ________________ c
9. 1 tbsp = ________________ ml
10. 1/150 gr = ________________ mg

82

ACTIVITY SHEET 8

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 10

Convert medication dosages from one unit of measurement to another unit of measurement.

The practice exercises below will help you become confident, as well as to become flawlessly accurate when converting between apothecary and metric.

DIRECTIONS

Use the equivalent table provided in Supplement 5 and one method of conversion to complete the exercises as directed.

State the method (formula) of conversion you will be using in the space below.

____

1. Apply the above formula consistently to the following practice exercises. Convert the stated amounts in the left column into the units specified in the right column.

a. 2 ml = ____________________ m

b. 0.5 ml = ____________________ m

c. 45 ml = ____________________ fld dr

d. 12 1/2 ml = ____________________ fld dr

e. 2500 ml = ____________________ fld oz

f. 420 ml = ____________________ fld oz

g. 150 mg = ____________________ gr

h. 250 mg = ____________________ gr

i. 1.5 G = ____________________ gr

j. 0.6 G = ____________________ gr

k. 30 m = ____________________ ml

l. 20 m = ____________________ ml

m. 2 fld dr = ____________________ ml

n. 1/2 fld dr = ________________ ml

o. 3 fld oz = ________________ ml

p. 20 fld oz = ________________ ml

q. 2 gr = ________________ mg

r. 10 gr = ________________ mg

s. 50 gr = ________________ G

t. 10 gr = ________________ G

Read the following statements carefully and determine the dosage needed.

u. The order reads to give gr 1/4 of morphine. Morphine on hand is in milligrams. How many milligrams will be needed? __________ mg

v. You are to give 2 drams of a cough syrup. If you were to use a syringe measured in ml, how many milliliters should you give? __________ ml

Converting measurements to household units

As mentioned previously, the least accurate system, which is still in use because of its familiarity among clients, is the household system. Most people have utensils that measure in the household system at home. For this reason, instructions on taking medication at home should be carefully discussed with the client to insure that he knows what can be used to measure medication consistently at home.

At times, either metric measurements or apothecary measurements will need to be converted into household measurements. The following exercises should provide some practice in these conversion processes.

2. Using the equivalent table in Supplement 5, convert the measurements in the left column into the household measurements specified in the right column.

a. 10 ml = ________________ tsp

b. 7 1/2 ml = ________________ tsp

c. 2 dr = ________________ tsp

d. 30 ml = ____________________ tbsp

e. 125 ml = ____________________ c

f. 500 ml = ____________________ c

g. 12 fld oz = ____________________ c

h. 2 fld oz = ____________________ c

i. 2000 ml = ____________________ qt

j. 60 Kg = ____________________ lb

Converting units within **the metric system**

Because the metric system is the preferred system of measurement in pharmacology, the two most common terms in which dosages are stated are in grams and milligrams.

3. Practice converting units from grams to milligrams by completing the exercises below.

a. 250 m = __________ G

b. 325 mg = __________ G

c. 2000 mg = __________ G

d. 50 mg = __________ G

e. 0.1 mg = __________ G

f. 0.4 G = __________ mg

g. 1.4 G = __________ mg

h. 25 G = __________ mg

i. 0.03 G = __________ mg

j. 0.001 G = __________ mg

ACTIVITY SHEET 9

CALCULATE MEDICATION DOSAGE

OBJECTIVE 11 **Determine the information necessary for dosage calculation.**

DIRECTIONS Practice reading the following orders and determine the necessary information for dosage calculation.

1. The physician's order reads Codeine 30 mg. p.o. q.4.h. for pain. The bottle of tablets reads Codeine 15 mg. per tablet.

   DOSE ORDERED ________________

   DOSE ON HAND ________________

   QUANTITY ON HAND ___________

2. The orders read to give 200 mg of Theophylline q.8 h. The bottle of tablets reads 400 mg per tablet.

   DOSE ORDERED ________________

   DOSE ON HAND ________________

   QUANTITY ON HAND ___________

3. The order reads to give Vistaril 25 mg. I.M. prn. nausea. The vial reads Vistaril 50 mg. / cc.

   DOSE ORDERED ________________

   DOSE ON HAND ________________

   QUANTITY ON HAND ___________

4. The order reads to give penicillin 400,000 units I.M. pre-op. The vial reads 600,000 units / 1.2 cc.

   DOSE ORDERED ________________

   DOSE ON HAND ________________

   QUANTITY ON HAND ___________

5. The order reads to give K-tabs 20 meq followed by 30 cc of water. The package read K-tab 20 meq / tab.

   DOSE ORDERED ________________

   DOSE ON HAND________________

   QUANTITY ON HAND ___________

ACTIVITY SHEET 10

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 12 **Use one method of dosage calculation.**

DIRECTIONS Calculate the amount of medication to be given in the exercises below. In the column labeled "Give", write the amount to be given with the correct label of units to be used.

State the formula you will be using in the following space.

____

Ordered	On hand	Give
Ex. Vistaril 50 mg	Vistaril 100 mg/2 cc	1 cc
1. Demerol 50 mg	Demerol 50 mg/tab	________
2. Aspirin 325 mg	Aspirin 650 mg/2 tab	________
3. Valium 5 mg	Valium 10 mg/2 cc	________
4. Theophylline 150 mg	Theophylline 100 mg/tab	________
5. Aldomet 500 mg	Aldomet 250 mg/tab	________
6. Capoten 12.5 mg	Capoten 25 mg/tab	________
7. Feosol 150 mg	Feosol 300 mg/5 cc	________
8. Furosemide 60 mg	Furosemide 80 mg/2 cc	________
9. Codeine gr 1/4	Codeine 30 mg/cc	________
10. Tylenol gr 10	Tylenol 300 mg/tab	________
11. Penicillin 300,000 u	Penicillin 600,000 u/cc	________
12. Vistaril 65 mg	Vistaril 100 mg/2 cc	________

ACTIVITY SHEET 11

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 13

Calculate medication dosages proportionate to body weight.

DIRECTIONS

Calculate each daily dosage necessary below, and then calculate the individual dose from the information given.

	Drug dosage (mg/kg)	Person's weight	Daily dosage	Number of doses	Individual dose
1.	1 mg/kg	10 kg	______	2	______
2.	15 mg/kg	25 kg	______	3	______
3.	2.5 G/kg	42 kg	______	4	______
4.	10 mg/kg	220 lb	______	4	______
5.	1.5 G/kg	176 lb	______	3	______

ACTIVITY SHEET 12

CALCULATE MEDICATION DOSAGE

OBJECTIVE 14

Calculate medication dosages for infants and children using Clark's rule.

DIRECTIONS

Use the Clark's rule formula to solve the following practice exercises.

1. Barry is 6 months old and weighs 15 pounds. He is to receive a medication with an average adult dose of 300 mg. How many milligrams should Barry receive?

   ____

2. Erin is 4 years old and weighs 40 pounds. The average adult dose of her medication is 10 mg. How many milligrams should Erin receive?

   ____

3. Paul is 10 and weighs 125 pounds. The average adult dose of his medication is 1 grain. How many milligrams should Paul receive?

   ____

4. Toby weighs 10 kg. The average adult dose of her medication is 100 mg. How many milligrams should Toby receive?

   ____

5. Chad is 10 years old and weighs 35 kg. The average adult dose of his medication is 1 mg. How many milligrams should he receive?

   ____

ACTIVITY SHEET 1

1. Numbers to be read.

   a. 43
   b. 8429
   c. 35,000
   d. 17 3/5
   e. 3 5/34
   f. 11/150
   g. 3.055
   h. 0.0592
   i. 314.14
   j. 3,680,000.72

2. a. 843
   b. 34892
   c. 660,000
   d. 22 1/8
   e. 1 1/125
   f. 51/58
   g. 9.012
   h. 0.0138
   i. 101.05
   j. 1,000,005.33

3. a. Nine hundred thirty two
   b. Three hundred forty thousand twenty nine
   c. Twenty nine and one half
   d. Fifty eight one thousandths
   e. Two million sixteen thousand two hundred three and ninety two one hundredths.

ACTIVITY SHEET 2

1. Addition

   a. 13
   b. 50
   c. 642
   d. 5124
   e. 196
   f. 771
   g. 966
   h. 1,302,002

2. Subtraction

a. 6
b. 35
c. 137
d. 814
e. 681
f. 5440
g. 23137
h. 280,000

3. Multiplication

a. 24
b. 154
c. 403
d. 5544
e. 505
f. 22620
g. 97180
h. 572,413

4. Division

a. 7
b. 8
c. 5
d. 43
e. 24
f. 119
g. 8
h. 548

ACTIVITY SHEET 3

1. Reduction of fractions

a. 1/4
b. 1/3
c. 3/4
d. 4/11
e. 3/20
f. 2 11/20

2. Addition of fractions

a. 3/4
b. 7/9
c. 19/24
d. 23/26
e. 1 1/12
f. 1 11/63
g. 4 17/20
h. 6 7/12

3. Subtracting fractions

a. 1/30
b. 2/9
c. 1/2
d. 3/8
e. 7/24
f. 3/4
g. 12 15/26
h. 57/100

4. Multiplication of fractions

a. 1/9
b. 30/39
c. 4/9
d. 7/15
e. 1
f. 3/5
g. 3 3/5
h. 2 1/2

5. Division of fractions

a. 1/2
b. 3/8
c. 1 1/4
d. 9/10
e. 4 4/9
f. 32
g. 9 2/3
h. 19 4/5

ACTIVITY SHEET 4

1. Addition of decimals

a. 2.9
b. 1.09
c. 1.51
d. 9.606
e. 0.982
f. 10.745
g. 2.00172
h. 94.274

2. Subtraction of decimals

a. 2.4
b. 21.75
c. 17.799
d. 0.012
e. 99.999
f. 0.46
g. 0.021
h. 0.0994

3. Multiplication of decimals
    - a. 6.6
    - b. 0.95
    - c. 0.003
    - d. 0.594
    - e. 0.748
    - f. 0.1449
    - g. 0.12099
    - h. 20.61687
4. Division of decimals
    - a. 40
    - b. 20
    - c. 7.2
    - d. 8
    - e. 3
    - f. 0.42
    - g. 0.93125
    - h. 0.23

ACTIVITY SHEET 5

1. 3 1/2 pt
2. 5 ft
3. 96.8 lb
4. 4 1/2 qt
5. 1 1/4 hr
6. a. 30 minutes
    b. 4 1/2 miles
7. a. 75 grams
    b. 21.6 grams
8. a. 15 days
    b. 4 pounds

ACTIVITY SHEET 6

1. a. 3
   b. 2
   c. 4
   d. 8
   e. 14
   f. 1 1/2
2. a. iiss
   b. vi
   c. ix
   d. xii
   e. viiiss
   f. xiss
3. a. grain two
   b. drams one and one-half
   c. sixty minims
   d. grains seven and one-half
   e. three and one-fourth ounces
4. a. gr iii
   b. m xv
   c. 60 gtt
   d. oz ivss
   e. gr 1/150
   f. dr iv
   g. 2 1/4 oz
   h. 20 1/2 gr

ACTIVITY SHEET 7

1. 15 gtt
2. 1 oz
3. 1 c
4. 1 L
5. 60 mg
6. 15 gr
7. 1 kg
8. 1 c
9. 15 ml
10. 0.4 mg

ACTIVITY SHEET 8

1. a. 30
   b. 7 1/2
   c. 9
   d. 2 1/2
   e. 80
   f. 14
   g. 2 1/2
   h. 3 3/4
   i. 22 1/2
   j. 10
   k. 2
   l. 1.3 or 1/3
   m. 10
   n. 2.5 or 2 1/2
   o. 90
   p. 600
   q. 120
   r. 600
   s. 3.3 or 3 1/3
   t. 0.6
   u. 15 milligrams
   v. 10 milliliters
2. a. 2
   b. 1 1/2
   c. 2
   d. 2
   e. 1/2
   f. 2
   g. 1 1/2
   h. 1/4
   i. 2
   j. 132

3. a. 0.25
   b. 0.325
   c. 2
   d. 0.05
   e. 0.0001
   f. 400
   g. 1400
   h. 25000
   i. 30
   j. 1

ACTIVITY SHEET 9

1. 30 mg.
   15 mg.
   1 tablet
2. 200 mg.
   400 mg.
   1 tablet
3. 25 mg.
   50 mg.
   1 cc.
4. 400,000 units
   600,000 units
   1.2 cc
5. 20 meq
   20 meq
   1 tablet

ACTIVITY SHEET 10

1. 1 tab
2. 1 tab
3. 1 cc
4. 1 1/2 tab
5. 2 tab
6. 1/2 tab
7. 2 1/2 cc
8. 1 1/2 cc
9. 1/2 cc
10. 2 tab
11. 1/2 cc
12. 1.3 cc

ACTIVITY SHEET 11

Daily	Individual
1. 10 mg	5 mg
2. 375 mg	125 mg
3. 105 G or 10500 mg	26.25 G or 26250 mg
4. 1000 mg	250 mg
5. 120 G	40 G

ACTIVITY SHEET 12

1. 30 mg
2. 2.66 mg
3. 5/6 or 0.83 gr or 49.8 mg (50 mg)
4. 14.66 or 14 2/3 mg
5. 0.51 mg

ASSIGNMENT SHEET 1

CALCULATE MEDICATION DOSAGE

I

OBJECTIVE 15

Determine correct action to follow when calculated results show unusual dosage results.

NAME ______________________ SCORE _______

INTRODUCTION

Whenever you are calculating a dosage, the resultant amount should be reasonable. However, this alone does not ensure accuracy. Your calculations should be double checked for accuracy, and if you have any doubt, your supervising nurse should be asked to check the work also. If the supervising nurse obtains an unusual answer, the pharmacy should be called to confirm that the calculation is correct and that the resultant amount is within normal dosages for that particular medication. If you are notified that the dosage is unusual, the physician should be contacted to verify the order, as well as to confirm the reason for the unusual dosage. You must then decide whether to give the medication or not, based on your own judgement. **Remember**, the practical nurse's primary responsibility is to follow correct procedure when encountering an unusual dosage amount.

ONCE AGAIN...

The correct steps to follow when you encounter an unusual result for a dosage calculation include

1—Double check the calculation yourself

2—Have your supervising nurse check the calculation

3—Call the pharmacy to confirm the calculation; also confirm that the dosage amount is within normal dosages

4—Call the physician to verify the order and to confirm the reason for the unusual dosage

5—Decide whether or not to give the medication to the client

DIRECTIONS

As a practical nurse giving medications, you must frequently follow procedures and make judgments as you work. In dosage calculation, there are times when unusual answers are correct and times when they are incorrect. Evaluate the following case studies to help you become more accustomed to making decisions based on the circumstances involved.

Case Study 1

A physician has ordered a medication. The result of your dosage calculation is that 6 cc of a medication should be given. The maximum dosage for this medication is 3 cc. What should be the first step when you calculate to 6 cc?

Who should be the first person contacted?

The pharmacist has been called about the dosage calculation. She tells you that your calculation is correct, and although the dosage is greater than average, she has heard that the dosage in question is being used for research purposes and has had some very good results with some patients. What should you do now?

Case Study 2

A medication has been ordered and calculated so that five 10 mg tablets are to be given. The supervising nurse tells you that he thinks this is too high since the reference books say only 10 mg are to be given. He tells you to call the physician who ordered the dosage. The physician tells you that this particular patient needs a high load dose of a medication, and although 10 mg is the standard dose, this high dosage will be used only until the blood level of the medication is sufficient for effects to take place. What should you do now?

OBJECTIVE 15	Answer should include the following information:
Case Study 1	Double check the calculation
	Supervising nurse
	Call physician to verify order and confirm the reason for unusual dosage
Case Study 2	Decide whether or not to give the medication to the client.

WRITTEN TEST

CALCULATE MEDICATION DOSAGE

I

NAME ______________________________ SCORE ________

OBJECTIVE 1

Identify the units in each measurement system used in pharmacology. Write "M" for metric, "A" for apothecary, or "H" for household in the blanks provided.

1. tbsp __________
2. mg __________
3. oz. __________
4. qt __________
5. cc __________

OBJECTIVE 2

Distinguish between characteristics of each system of measurement. Write the name of the system of measurement each statement describes in the blanks provided.

1. ______________ Least accurate system
2. ______________ Newest system of measurement
3. ______________ System used only for pharmacology
4. ______________ Most accurate system
5. ______________ System most familiar in America

OBJECTIVE 3

Interpret verbal and written numbers. Interpret written numbers by copying them exactly as you see them—then, write each number out in word form. Write the answers in the blanks provided.

1. a. 548,100 ____
   b. 3,015,030 ____
   c. 432.57 ____
   d. 2.081 ____
   e. 52 2/3 ____

2. Write each number in number form in the space provided.

   a. Twenty eight thousand forty two ____________________

   b. Six billion, two hundred fifty thousand________________

   c. Five thousand four hundred and nine tenths ____________

   d. One and three hundred seven thousandths ____________

OBJECTIVE 4

Calculate using the basic math skills of addition, subtraction, multiplication, and division. Solve each problem, and record the answer in the appropriate place.

1. 185 + 18 + 2984 = ________________________________
2. 381 - 244 = ________________________________
3. 155 x 34 = ________________________________
4. 952 ÷ 7 = ________________________________
5. 23(3) = ________________________________
6. 72 ÷ 8 = ________________________________

OBJECTIVE 5

Calculate using fractions. Write the correct answers in the blanks provided.

1. Express these fractions as whole or mixed numbers.

   a. 18/3 = ________________________________

   b. 14/4 =________________________________

   c. 45/13 = ________________________________

   d. 417/20 = ________________________________

2. Add the following fractions.

   a. 1/6 + 1/4 + 1/3 = ____________________________

   b. 1/5 + 2/3 + 5/6 = ____________________________

   c. 2 2/3 + 7 4/9 = ____________________________

   d. 1/2 + 3 1/9 + 4/6 = __________ ________________

3. Subtract the following fractions.

   a. 2/3 - 1/6 = ______________________
   b. 9/10 - 4/5 = ______________________
   c. 17 1/2 - 5 1/12 = ______________________
   d. 4 15/36 - 3 7/8 = ______________________

4. Multiply the following fractions and reduce them to their lowest terms.

   a. 3/4 x 2/7 = ______________________
   b. 1/15 x 1/2 = ______________________
   c. 2 1/3 x 3/5 = ______________________
   d. 11 1/4 x 2 1/2 = ______________________

5. Divide the following fractions and reduce to lowest terms.

   a. 1/2 ÷ 1/3 = ______________________
   b. 3/4 ÷ 5/7 = ______________________
   c. 2 3/5 ÷ 2/3 = ______________________
   d. 3 1/7 ÷ 2 1/4 = ______________________

OBJECTIVE 6

Calculate using decimals. Write the correct answers in the blanks provided.

1. Add the following numbers.

   a. 0.33 + 0.89 + 0.002 = ______________________
   b. 1.892 + 0.91 + 3.5 = ______________________
   c. 15.1 + 1.01 + 0.101 = ______________________
   d. 247.47 + 8.9934 + 1.46 = ______________________

2. Subtract the following numbers.

   a. 1.306 - 0.542 = ____________________

   b. 0.46 - 0.0054 = ____________________

   c. 3.12 - 1.88 = ____________________

   d. 28.9 - 0.791 = ____________________

3. Multiply the following numbers.

   a. 0.3 x 0.55 = ____________________

   b. 3.5 x 6.22 = ____________________

   c. 0.731 x 4.6 = ____________________

   d. 24.8 x 1.25 = ____________________

4. Divide the following numbers.

   a. 0.055 ÷ 0.5 = ____________________

   b. 1.2 ÷ 0.6 = ____________________

   c. 0.768 ÷ 0.04 = ____________________

   d. 2.49 ÷ 4.98 = ____________________

OBJECTIVE 7

Calculate using ratios and proportions. Write the correct answers in the blanks provided.

1. 4 : 1 :: X : 5 = ____________________

2. 5 : 6 :: X : 3 = ____________________

3. 10 : X :: 2 : 15 = ____________________

4. 125 : 1 :: 25 : X = ____________________

5. 12 : 144 :: 1 : X = ____________________

OBJECTIVE 8

Read and write apothecary Roman numerals. Write the correct answers in the blanks provided.

1. Write the following numbers in Roman numeral form.

   a. 3 ______________________

   b. 7 ______________________

   c. 9 ______________________

   d. 2 1/2 ______________________

   e. 12 ______________________

2. Write the following Roman numerals in Arabic numeral form.

   a. xi ______________________

   b. xv ______________________

   c. ii ______________________

   d. xiv ______________________

   e. iss ______________________

OBJECTIVE 9

Determine equivalents among the three systems of measurement. Use the following chart to determine the equivalents below.

Approximate equivalent measures of fluids and weight

	0.060 ml	m i	1 gtt
	1 ml = 1cc	m xv (15 m)	15 gtt
F	5 ml (4)	1 fl. dr, f	1 tsp
L	15 ml	3 f	1 tbsp
U	30 ml	1 fld oz	2 tbsp (1/8 c)
I	250 ml (240)	8 fld oz	1 cup or glass
D	500 ml	16 fld oz	1 pt
	1000 ml = 1L	32 fld oz	1 qt
	4 L	128 fld oz	1 gal

	0.4 mg	gr 1/150	
	1 mg	gr 1/60	
W	0.060 G = 60 mg	gr i	
E	0.5 G = 500 mg	gr viiss (7 1/2 gr)	1/8 tsp
I	1 G = 1000 mg	gr xv (15 gr)	1/4 tsp
G	4 G = 4000 mg	60 gr = 1 dr	1 tsp
H	15 G	4 dr	1 tbsp
T	30 G	1 oz	2 tbsp
	0.455 Kg	12 oz	1 lb
	1 Kg		2.2 lb

Write the correct answers in the blanks provided.

1. 1 tsp = ______________________ dr
2. 30 ml = ______________________ oz
3. 250 cc = ______________________ c
4. 60 mg = ______________________ gr
5. 1 lb = ______________________ kg
6. 1/8 tsp = ______________________ G

OBJECTIVE 10

Convert medication dosages from one unit of measurement to another unit of measurement. Write the correct answers in the blanks provided.

1. Convert milligrams to grams and grams to milligrams as indicated.

   a. 4 G = ____________________ mg
   b. 650 mg = ____________________ G
   c. 300 mg = ____________________ G
   d. 2.45 G = ____________________ mg
   e. 0.09 G = ____________________ mg
   f. 60 mg = ____________________ G

2. Using the equivalent chart listed in Objective 9 of this test, convert the following metric and apothecary measurements as indicated.

   a. 15 ml = ____________________ dr
   b. 4 oz = ____________________ ml
   c. 1.5 L = ____________________ oz
   d. 120 mg = ____________________ gr
   e. 1.2 mg = ____________________ gr
   f. 1/2 gr = ____________________ mg

3. Convert the following measurements from metric and apothecary units to household units of measurement.

   a. 1250 ml = ____________________ c
   b. 20 ml = ____________________ tsp
   c. 4.5 L = ____________________ qt
   d. 90 gr = ____________________ tsp
   e. 120 kg = ____________________ lb

OBJECTIVE 11

Determine the information necessary for dosage calculation. Write an "X" in the blank before each piece of information necessary for dosage calculation.

1. __________ Quantity on hand
2. __________ Total amount on hand
3. __________ Dosage on hand
4. __________ Weight of patient
5. __________ Dosage ordered

OBJECTIVE 12

Use one method of dosage calculation. Determine the amounts of the following medications to be given. Write the correct answers in the blanks provided.

1. Ordered: Demerol 35 mg On hand: 75 mg/cc
   Give ______________
2. Ordered: Vistaril 60 mg On hand: 100 mg/2 cc
   Give ______________
3. Ordered: Nifedipine 15 mg On hand: 10 mg/tab
   Give ______________
4. Ordered: Codeine 1/4 gr On hand: 30 mg/cc
   Give ______________
5. Ordered: Theophylline Elixir 225 mg
   On hand: 150/5 cc
   Give ______________

OBJECTIVE 13

Calculate medication dosages proportionate to body weight. Write the correct answers in the blanks provided.

1. 10 mg/kg with client's weight 65 kg ____________ mg
2. 5 mg/kg with client's weight 75 kg ____________ mg
3. 15 mg/kg with client's weight 24 kg ____________ mg
4. 20 mg/kg with client's weight 187 lb ____________ mg
5. 2 G/kg with client's weight 100 kg ____________ mg

OBJECTIVE 14

Calculate medication dosages for infants and children using Clark's rule. Write the correct answers in the blanks provided.

1. Adult dosage is 50 mg. Child's weight is 30 pounds.
   ____________mg
2. Adult dosage is 150 mg. Child's weight is 75 pounds.
   ____________mg
3. Adult dosage is 3 gr. Child's weight is 100 pounds.
   ____________gr
4. Adult dosage is 5 gr. Child's weight is 50 pounds.
   ____________gr
5. Adult dosage is 60 mg. Child's weight is 87 pounds.
   ____________mg

NOTICE

The following assignment sheet is not part of the written test, if this activity has not been completed check with your instructor.

OBJECTIVE 15

Determine correct action to follow when calculated results show unusual dosage results.

SCORE ____

OBJECTIVE 1

1. Household
2. Metric
3. Apothecary
4. Household
5. Metric

OBJECTIVE 2

1. Household
2. Metric
3. Apothecary
4. Metric
5. Household

OBJECTIVE 3

1. a. Five hundred forty eight thousand one hundred
   b. Three million fifteen thousand thirty
   c. Four hundred thirty two and fifty seven hundredths
   d. Two and eighty one thousandths
   e. Fifty two and two thirds
2. a. 28,042
   b. 6,000,250,000
   c. 5,400.9
   d. 1.307

OBJECTIVE 4	1. 3187
	2. 137
	3. 5270
	4. 56
	5. 69
	6. 9
OBJECTIVE 5	1. a. 6
	b. 3 1/2
	c. 3 6/13
	d. 20 17/20
	2. a. 3/4
	b. 1 7/10
	c. 10 1/9
	d. 4 5/18
	3. a. 1/2
	b. 1/10
	c. 12 5/12
	d. 13/24
	4. a. 3/14
	b. 1/30
	c. 1 2/5
	d. 28 1/8

5. a. 1 1/2
   b. 1 1/20
   c. 3 9/10
   d. 1 25/63

OBJECTIVE 6

1. a. 1.222
   b. 6.302
   c. 16.211
   d. 257.9234
2. a. 0.764
   b. 0.4546
   c. 1.24
   d. 28.109
3. a. 0.165
   b. 21.77
   c. 3.3626
   d. 31
4. a. 0.11
   b. 2
   c. 19.2
   d. 0.5

OBJECTIVE 7

1. 20
2. 2.5 or 2 1/2
3. 75
4. 0.2 or 1/5
5. 12

OBJECTIVE 8	1. a. iii or III
	b. vii or VII
	c. ix or IX
	d. iiss
	e. xii or XII
	2. a. 11
	b. 15
	c. 2
	d. 14
	e. 1 1/2
OBJECTIVE 9	1. 1
	2. 1
	3. 1
	4. 1
	5. 0.455
	6. 0.5
OBJECTIVE 10	1. a. 4000
	b. 0.65
	c. 0.3
	d. 2450
	e. 90
	f. 0.06

2. a. 3
   b. 120
   c. 48
   d. 2
   e. 1/50
   f. 30
3. a. 5
   b. 4 or 5
   c. 4 1/2
   d. 1 1/2
   e. 264

OBJECTIVE 11

1, 3, 5

OBJECTIVE 12

1. 0.47 cc
2. 1.2 cc
3. 1 1/2 tab
4. 0.5 or 1/2 cc
5. 7 1/2 cc

OBJECTIVE 13

1. 650
2. 375
3. 360
4. 1700
5. 200,000

OBJECTIVE 14

1. 10 mg
2. 75 mg
3. 2 gr
4. 1 2/3 gr
5. 34.8 mg

OBJECTIVE 15

Refer to answers to Assignment Sheet 1.

OBJECTIVE SHEET

DOCUMENT MEDICATIONS

II

INTRODUCTION

Documentation is the recording of nurses care that has taken place. As a practical nurse, it is very important that you learn how to communicate actions through documentation. When handling medications, this communication skill is critical in order to avoid errors, such as missed or extra doses of medication. Accuracy in reading, interpreting, and writing information is necessary to become proficient in documentation. Furthermore, you should constantly be aware of the legalities involved in documenting medications. Use documentation as a communication tool to provide safety for the patient and yourself.

UNIT OBJECTIVE

After completing this unit, the student should be able to document information concerning the administration of medication in correct medical format. The student will show these competencies by completing assignment sheets, job sheet, and the written test with a minimum of 85 percent accuracy.

PREREQUISITES

Before studying this unit, the student will have successfully completed Unit I: "Calculate Medication Dosage".

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Match common abbreviations and symbols used in the documentation of the administration of medications to their correct meanings.
2. Identify legal implications for the practical nurse in relation to medication documentation.
3. Identify the documentation necessary when obtaining a medication.
4. Identify the documentation necessary when giving a medication.
5. Match systems of giving medications with their definitions.
6. Identify steps necessary to transcribe orders.
7. Identify assessment data to be included in a medication history.
8. Identify documentation requirements for verbal and telephone orders.

9. Identify documentation requirements for standing orders.
10. Identify documentation requirements for storage, use, and waste of controlled substances.
11. Interpret written medication orders. (Assignment Sheet 1)
12. Transcribe medication orders. (Assignment Sheet 2)
13. Document administration of medication. (Assignment Sheet 3)
14. Complete patient assessment data included in a medication history. (Assignment Sheet 4)
15. Document verbal and telephone orders. (Assignment Sheet 5)
16. Document standing orders. (Assignment Sheet 6)
17. Document the storage, use and waste of controlled substances. (Assignment Sheet 7)
18. Demonstrate the ability to count controlled substances. (Job Sheet 1)

SUGGESTED ACTIVITIES

DOCUMENT MEDICATIONS II

PREPARATION

- Order materials to supplement unit.
- Obtain samples of legal action that involved good or poor charting of medications.
- Obtain samples of forms used for documentation of medication to illustrate the similarities in the forms.
- Set up exercises for students to practice administering drugs common to the local facility. Include a minimum of one routine order, one prn, and one one-time order.
- Make audio tapes for Assignment Sheet 5.
- Invite guest speaker

  NOTE: Please provide the guest speaker with the specific topic relevant to the unit of instruction ahead of time.
- Invite an attorney to discuss the importance of documentation and how the nurse can avoid liability issues.
- Invite a pharmacist to discuss regulation of drugs.

DELIVERY

Objective 1

- Review the symbols familiar to students.
- Provide examples of orders to show how abbreviations are used.
- Use *Nurse's Legal Handbook*, pages 192-195, to illustrate unclear use of abbreviations.
- Play games (concentration, flash cards) to help reinforce the use of abbreviations.
- Give students samples of local forms to use for documenting using abbreviations.

Objective 2

- Have a lawyer speak to the class about the importance of documentation of medication.

- Ask students to relate specific instances they have seen of good or poor charting.
- Review cases brought before the Board of Nursing in which the decision of the case rested on the charting.
- Discussion of the legal aspects of drug administration should include all of the following:
  - the five rights
  - individual accountability
  - documentation (Review in terms of legality)
- Schedule small group discussions to explore the practical nurse's legal responsibilities for drug administration and standard procedure to follow when medication errors occur.
- Emphasize that the practical nurse is accountable for his/her actions when administering care.

Objective 3

- Discuss the various methods used to order medications.
- Discuss the different types of pharmacies that facilities use to obtain medications.
- Discuss the importance of signing for controlled substances once you have received them.
- Discuss Handout 1.

Objective 4

- Discuss the use of the five rights for all routes of administration.
- Have students work in groups to determine the variables of each route and what would need to be documented.
- Have students design a form that they think would best meet the nurse's needs when documenting the administration of medications. Provide opportunities for groups to critique these.
- Provide students with forms from local facilities, and have them record the medications of one patient for a day if all were given as ordered.

- Discuss why medications would be held in your local facility.
- Discuss the implications that would follow if the reason for a hold on medication is not charted.
- Give each student a fictitious patient who is taking various medications. Have the students write down the patient teaching that would be necessary for their patient.
- Play password using names of common drugs that require teaching. Have the students give aspects of the teaching necessary for that drug as clues.
- Have students role play situations of patient teaching.

Objective 5

- Discuss each of the common types of physician's orders and the practical nurse's role and responsibility for each.
- Discuss why the recording of the route in stat and prn (stat and one-time orders) differs.
- Have students identify patients they have observed that would have been charted for prn medications. Have them write how they would have documented this information.
- Discuss Handout 2.

Objective 6

- Discuss legibility of transcription.
- Have students copy or write orders without signing their names to the order. Have the students pass the orders in, and then pass the orders back out in a random order. Allow the students to determine how many can be read by other students clearly.
- Provide the students with orders containing information in various places and have them interpret the orders.
- Provide the students with orders written by local physicians and practice interpretation.
- Review format of local nursing Kardex, as well as the form of medication card/system used.
- Have students evaluate two systems of documentation. Allow them to choose the system they think would be easier to maintain and have them explain why they believe this.

- Discuss the essential parts of the medication order.

- Role play situations between nurse and doctor or nurse and pharmacist in which the nurse must clarify orders.

- Review the five rights of medication

- Emphasize the need to document medication after it is given, documentation of medication is often considered the sixth right of medication.

Objective 7

- Have students consider the information they would give for their own medication history.

- Role play situations that could occur when taking a medication history. (Interviewing family member, patient who tells about history for the last 20 years etc.)

- Demonstrate the use of the format your local facility uses to document a medication history. Also, make other medication history forms available to the students, and explain how to use them.

Objective 8

- Give details of how verbal and telephone orders are used once licensure occurs.

- Discuss how verbal and telephone orders relate to students. Make it clear whether this is or is not allowed, and be specific in situation for students.

- Discuss how students should refuse a verbal or telephone order.

Objective 9

- Locate samples of standing orders used in local facilities. Ask students to imagine being the physician and discuss what they might include in their standing orders. Also have the students discuss why they chose to include specific information.

- Role play situations in which standing orders should and should not be used.

- Help students work through Assignment Sheet 6. Because the students need medical/surgical knowledge for this assignment, you may want to complete it as a group project. A nurse's handbook would be a good reference for this assignment.

Objective 10

- Provide sample forms used in local facilities, and explain their use.
- Discuss reasons that commonly cause waste of controlled substances.
- Discuss how the system provides for double checking to avoid illegal use of controlled substances.

APPLICATION

Objectives 11 through 17

- Use Assignment Sheet 1 to give students practice in interpreting written medication orders.
- Use Assignment Sheet 2 to give students practice in transcribing medication orders.
- Use Assignment Sheet 3 to give students practice in documenting medication administration.
- Use Assignment Sheet 4 to give students practice in patient assessment data included in a medication history.
- Use Assignment Sheet 5 to give students practice in documenting verbal and telephone orders.
- Use Assignment Sheet 6 to give students practice in documenting standing orders.
- Use Assignment Sheet 7 to give students practice in documenting storage, use and waste of controlled substances.

Objective 18

- Demonstrate procedure for counting controlled substances.
- Role play shift changes
- Complete Job Sheet 1.

EVALUATION

Pretest

- Pretest qualifying students.
- Determine individual study requirements from pretest results.
- Counsel students individually on pretest results and study requirements
- Modify materials in unit or create supplementary materials for individual students as required.

Practical Test

- Explain to students that they will be asked to demonstrate procedures on the job sheets to complete the practical test.
- Describe the rating scale used on the practical test.
- Reteach and retest as necessary.

Written Test

- Explain to students that they will be asked to demonstrate on the written test actions listed in the specific objectives.
- Give written test.
- Evaluate students on assignment sheet activities if not previously done.
- Reteach and retest if necessary.
- Complete appropriate section of competency profiles.
- Review individual and group performance in order to evaluate teaching methods. Adjust scope, sequence, or instructional approaches for additional lessons as required.

SUGGESTED RESOURCES

Publications

- Ford, Regina Daley (ed.). *Nurses's Legal Handbook*. Springhouse Corporation, 1985. (1111 Bethlehem Pike, Springhouse, PA., 19477)

UNIT REFERENCES

- Bayt, Phyllis Theiss. *Administering Medications: A Competency-Based Program for Health Occupations*. The Bobbs-Merrill Company, Inc., 1982.

- Clayton, Bruce D., Stock, Yvonne N. and Squire, Jessie E., *Squire's Basic Pharmacology for Nurses*, 8th Editions, C.V. Mosby Company, 1985.
- Ford, Regina Daley (ed.). *Nurses's Legal Handbook*. Springhouse Corporation, 1985. (1111 Bethlehem Pike, Springhouse, PA., 19477)
- Redman, Barbara K. *The Process of Patient Teaching in Nursing*, 5th edition, Mosby Company, 1983.
- Rice, Jane, and Skelley, Esther G., *Medications and Mathematics for the Nurse*, 6th Editions, Delmar Publishers, Inc., 1988.
- Woodrow, Ruth, *Essentials of Pharmacology for Health Occupations*, John Wiley and Sons, Inc., 1987.

PRETEST ANSWERS

DOCUMENT MEDICATIONS

II

OBJECTIVE 1

1. j
2. h
3. a
4. i
5. d
6. g
7. o
8. c
9. f
10. b

OBJECTIVE 2

1. c
2. d
3. b
4. d
5. a

OBJECTIVE 3

1. c
2. b
3. d

OBJECTIVE 4

1. a
2. d
3. c
4. b
5. a
6. c
7. c
8. b
9. a
10. c

OBJECTIVE 5	1. b
	2. c
	3. d
OBJECTIVE 6	1. b
	2. d
OBJECTIVE 7	1. c
	2. a
	3. d
OBJECTIVE 8	1. b
	2. c
	3. c
	4. c
	5. d
OBJECTIVE 9	1. a
	2. a
	3. d
	4. b
OBJECTIVE 10	1. b
	2. c
	3. d
OBJECTIVES 11-17	Refer to answers to Assignnment Sheets 1 through 7.
OBJECTIVE 18	Refer to Practical Test for Job Sheet 1.

Parts of a prescription

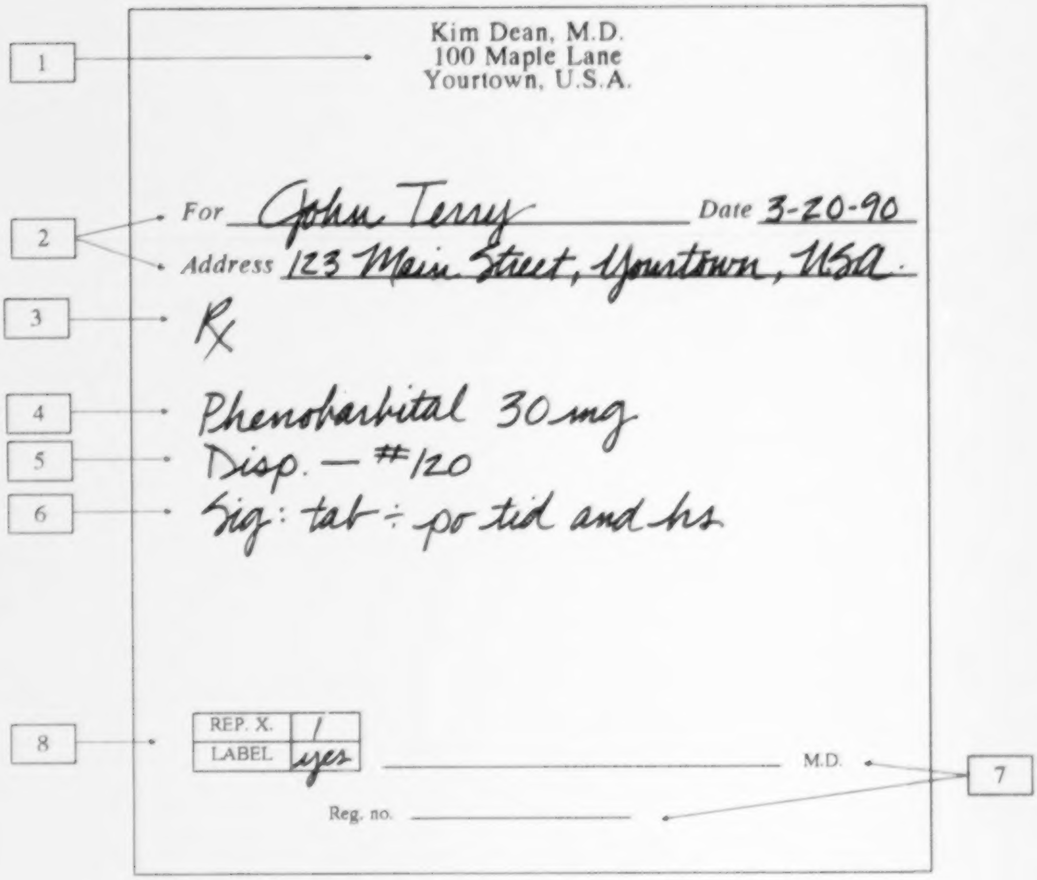
Prescriptions are written orders that are written on individual sheets of paper, instead of a chart. Usually, they are used for medications that are given for home use. Over-the-counter medications do not require prescriptions; however, sometimes a prescription may be written for an over-the-counter medication to provide the pharmacist and the patient with an accurate, complete medication listing. Prescriptions are required by law for certain medications. Specific information necessary for prescriptions is listed below.

1. The physician's name, address, telephone number, and registration number
2. The patient's name, address, and the date on which the prescription is written
3. The superscription that includes the symbol Rx
4. The inscription that states the names and quantities of ingredients to be included in the medications
5. The subscription that gives directions to the pharmacist for filling the prescription
6. The signature, which may include the abbreviation "sig," giving the directions for the patient
7. The physician's signature blank

   NOTE: A sample provided by your instructor will show that the area where the physician signs his name indicates whether or not generic medications can be used. This is indicated in various ways on prescriptions.

8. REPETATUR 0 1 2 3 prn—This is the area where the physician indicates whether or not the prescription can be refilled
9. LABEL—Direction to the pharmacist to label the medication appropriately

Reproduced by permission. MEDICATIONS & MATHEMATICS FOR THE NURSE 6/E by Jane Rice and Esther Skelly. Delmar Publishers Inc., Copyright 1988.



Kim Dean, M.D.
100 Maple Lane
Yourtown, U.S.A.

For John Terry Date 3-20-90
Address 123 Main Street, Yourtown, USA.

Rx

Phenobarbital 30 mg
Disp. — #120
Sig: tab ÷ po tid and hs

REP. X.	1
LABEL	yes

____________________ M.D.

Reg. no. ________________

Routine times for administration of medications.

Routine times for administration usually take into account the ease with which the staff can use them, as well as the optimum effect of most medications administered at certain time periods. The routine times for any facility should be stated in the policy book. Each facility determines the meaning of the abbreviations which relate to the frequency with which medications should be administered.

You should consider both the time the medication is to be given and the specific medication. For example, insulin may be ordered qd and the routine time is 9:00 a.m. for qd; however, the nurse also knows it should be given prior to breakfast. The knowledge about the individual medication then becomes the priority in the decision making process.

Additionally, avoid placing an administration time at the time of shift change, because this increases the frequency of missed or double dosages.

Given below are some examples of routine times.

Frequency	Hospital 1	Hospital 2
qd	9 a.m.	12 p.m.
bid	9 a.m. and 5 p.m.	8 a.m. and 8 p.m.
tid	9 a.m., 1 p.m., and 5 p.m.	8 a.m., 4 p.m., and 12 a.m.
qid	9 a.m., 1 p.m. 5 p.m., 9 p.m.	12 a.m., 6 a.m. 12 p.m., 6 p.m.
qHS	9 p.m.	10 p.m.
q4h	9 a.m., 1 p.m., 5 p.m., 9 p.m., 1 a.m., 5 a.m.	8 a.m., 12 p.m., 4 p.m., 8 p.m., 12 a.m., 4 a.m.

Frequency	Hospital 1	Hospital 2
q6h	8 a.m., 2 p.m. 8 p.m., 2 a.m.	12 a.m., 6 a.m. 12 p.m., 6 p.m.

PRETEST

DOCUMENT MEDICATIONS

II

NAME ______________________________ SCORE ________

OBJECTIVE 1

Match common abbreviation and symbols used in the documentation of the administration of medications to their correct definitions. Write the letter of the correct answer in the blanks provided.

___ 1. Ampule

___ 2. Milliequivalent

___ 3. Both eyes

___ 4. Water

___ 5. Take

___ 6. Fluid

___ 7. Intramuscular

___ 8. Rectal

___ 9. Before meals

__ 10. Hypodermic

a. OU

b. H

c. R

d. Rx

e. IM

f. ac

g. fl

h. mEq

i. H_2O

j. amp

k. cc

m. sol

n. T

o. IM

p. bod

OBJECTIVE 2

Identify legal implications for the practical nurse in relation to medication documentation. Write the letter of the correct answer in the blank provided.

____1. What method should you use to provide a legal record of the medications you gave a patient?

a. Verbally inform charge nurse

b. Fill out physician forms

c. Complete documentation of the administration of the medication

d. Certify the facility forms with a legal stamp of approval

____2. Which of the following requires documentation of the administration of medications?

a. Federal law

b. State law

c. Professional standards and facility policy

d. All of the above

____3. Who has the greatest legal responsibility for the practical nurse documenting medication administration?

a. The physician

b. The practical nurse

c. The charge nurse

d. The facility

____4. How often should the practical nurse update his/her knowledge of documentation requirements?

a. Every 10 yrs.

b. Every 5 yrs.

c. Every year

d. Constantly

___ 5. Inaccurate or incomplete documentation could lead to

a. Legal penalties against the LPN

b. The LPN being required to fill out several additional forms

c. Legal penalties against the physician

d. All of the above

OBJECTIVE 3

Identify the documentation necessary when obtaining a medication. Write the letter of the correct answer in the blank provided.

___ 1. As the LPN you may have to order medications from a pharmacy. Which policy should you follow to order medications?

a. Med-order policy

b. Pharmacy policy

c. Each facility has their own ordering method

d. None of the above

___ 2. How can an LPN provide a record of receiving a package of controlled substances?

a. By filling out several forms

b. By signing their name stating they have received the package

c. Having the charge nurse sign for it

d. Having the physician sign for it

___ 3. What type of pharmacies do facilities use?

a. A pharmacy within the facility

b. A pharmacy outside the facility

c. Several pharmacies

d. All of the above

OBJECTIVE 4

Identify the documentation necessary when giving a medication. Write the letter of the correct answer in the blank provided.

____1. Where should the effects of medications be recorded?

a. Nurses notes

b. Medication sheet

c. Medication card

d. Nursing Kardex

____2. Forms for recording medication administration

a. Are standard throughout all facilities

b. Remain in effect for a minimum of 5 years

c. Are unnecessary if nurse's notes are used properly

d. Vary with each facility

____3. Where should an LPN record the reason for holding a medication?

a. Nursing Kardex

b. Doctor's order sheet

c. Nurse's notes

d. All of the above

____4. What additional information is necessary when documenting an injection?

a. The time

b. The specific location

c. The general area

d. The amount

___ 5. How should you evaluate the patient's understanding of his medications after patient teaching?

a. Have patient verbalize instructions

b. Send patient home immediately after teaching

c. Check for non-verbal signals during teaching

d. Provide a written test of the information

___ 6. What is used to document the goals of patient teaching?

a. Nurse's notes

b. Medication sheets

c. Nursing Kardex

d. Doctor's orders

___ 7. Patient teaching

a. Is very rarely carried out

b. Should be completed by the physician *only*

c. Is a continuous process

d. None of the above

___ 8. After patient teaching, where should you record a summary of the actual patient teaching that took place?

a. Nursing Kardex

b. Nurse's notes

c. Medication sheets

d. Doctor's orders

____9. Patient teaching should begin

a. As soon as the patient receives his first dose of medications

b. When the patient arrives

c. If the patient has problems with his medications

d. Only if the doctor orders it

___10. Which of the following is sometimes considered the sixth right of medication administration?

a. Correct route

b. Time

c. Complete documentation

d. Correct medication

OBJECTIVE 5

Match systems of giving medications with their definitions. Write the letter of the correct answer in the blank provided.

____1. Which of the following situations would most likely need a one-time order?

a. Chest pain

b. Pre-operative

c. Hypertension

d. Infection

____2. What information is necessary when recording a prn, which is not necessary when documenting a routine medication?

a. Time of administration

b. Location of injection

c. Reason for administration

d. None of the above

___ 3. Medication to be given to patients to meet an immediate need are called

a. Routine

b. PRN

c. One-time

d. Stat doses

OBJECTIVE 6

Identify steps necessary to transcribe medication orders. Write the letter of the correct answer in the blanks provided.

___ 1. If unable to determine the meaning of an order, the first person to contact is the

a. Pharmacist

b. Physician

c. Medical records department

d. Charge nurse

___ 2. When transcribing orders, where should you write the order?

a. Medication sheet

b. Medication card

c. Nursing Kardex

d. All of the above

OBJECTIVE 7

Identify assessment data to be included in a medication history. Write the letter of the correct answer in the blanks provided.

___ 1. Who should be asked the medication history if the patient is unable to answer?

a. Closest relative

b. Oldest friend

c. Person who lives with the patient

d. Personal physician and pharmacist

____2. Which part of the medication history must be completed before any medication is given?

a. Allergy

b. Past medications

c. Knowledge of medication effects

d. Medication preference

____3. Usually, the medication history is obtained

a. After the patient has been treated

b. After the physician has recommended a medication

c. Before ordering a patient's medication

d. During the admission of the patient

OBJECTIVE 8

Identify documentation requirements for verbal and telephone orders. Write the letters of the correct answer in the blanks provided.

____1. Who may take verbal orders?

a. Nursing assistant

b. Licensed nurse

c. Family member

d. Student nurse

____2. Which of the following is recommended when an LPN receives a telephone order?

a. Write on a note pad first

b. Call physician back to verify that it was the physician

c. Have another person listen and verify order

d. Refuse all telephone orders

___ 3. After giving a verbal order, when should the physician co-sign the order?

a. Within 2 hours

b. Within 12 hours

c. Within 24 hours

d. He does not have to sign the order

___ 4. After taking a telephone order, when should the physician co-sign the order?

a. Within 2 hours

b. Within 12 hours

c. Within 24 hours

d. She does not have to sign the order

___ 5. You have just taken a telephone order, and written it on the chart. What should you do next?

a. Have the physician sign it

b. Have the charge nurse check it

c. Administer the medication immediately

d. Have some other person repeat it back to the person calling

OBJECTIVE 9

Identify documentation requirements for standing orders.
Write the letter of the correct answer in the blanks provided.

___ 1. What aspect of a medication on a standing order should be considered with special caution?

a. Contraindications

b. Action

c. Route of medication

d. Generic name

____2. What basic nursing principle is most necessary when determining the use of standing orders?

a. Assessment

b. Planning

c. Implementing

d. Documenting

____3. Standing orders are

a. Typed

b. Written

c. Posted on a medical information board

d. Both a and b

____4. Who should you check with first if you are unsure about implementing a standing order?

a. The physician

b. The charge nurse

c. The pharmacy

d. None of the above

OBJECTIVE 10

Identify documentation requirements for storage, use and waste of controlled substances. Write the letter of the correct answer in the blanks provided.

____1. Which medication would require a controlled substance waste form if the patient dropped the tablet in the waste basket?

a. Antipyretic

b. Narcotic

c. Vasodilator

d. Bronchodilator

___ 2. Where should controlled substances be kept?

- a. In the patient's medication drawer
- b. In the nurses' station
- c. In a locked cabinet
- d. In the pharmacy

___ 3. A complete count of controlled substances is taken

- a. Every 24 hours
- b. At the beginning of every shift
- c. At the end of every shift
- d. Both b and c

NOTICE	In addition to the pretest, the student will be required to demonstrate mastery of the following objectives.	
OBJECTIVE 11	**Interpret written medication orders.**	SCORE _____
OBJECTIVE 12	**Transcribe medication orders.**	SCORE _____
OBJECTIVE 13	**Document administration of medication.**	SCORE _____
OBJECTIVE 14	**Complete patient assessment data included in a medication history.**	SCORE _____
OBJECTIVE 15	**Document verbal and telephone orders.**	SCORE _____
OBJECTIVE 16	**Document standing orders.**	SCORE _____
OBJECTIVE 17	**Document the storage, use and waste of controlled substances.**	SCORE _____
OBJECTIVE 18	**Demonstrate the ability to count controlled substances.**	RATING ____

INFORMATION SHEET	DOCUMENT MEDICATIONS	II

OBJECTIVE 1

Match common abbreviations and symbols used in the documentation of the administration of medications to their correct meanings.

There are many abbreviations and symbols used when documenting the administration of medications. Each facility has an approved list of abbreviations and symbols which each practitioner should refer to and use. The list on the following page contains many of the most commonly used abbreviations and symbols. You should know these prior to administering medications.

Abbrev./ Symbol	Meaning
aa, $\overline{aa}$	of each
ac	before meals
ad	right ear
ad lib	as desired
am	morning
amp	ampule
amt	amount
as	left ear
au	both ears
bid	twice a day
$\bar{c}$	with
cap	capsule
DC, disc	discontinue
elix	elixir
et	and
ext	extract
fl, fld	fluid
h, hr	hour
H	hypodermic
H_2O	water
H_2O_2	hydrogen peroxide
hs, HS	hours of sleep
ID	intradermal
IM	intramuscular
IV	intravenous
mEq	milliequivalent
noc, noct, N	night
NPO, npo	nothing by mouth
NS, N/S	normial saline

Abbrev./ Symbol	Meaning
OD	right eye
OS	left eye
os	mouth
OU	both eyes
per, /	by means of
PM, pm	after noon
po, PO, per os	by mouth
prn, PRN	as necessary
qd	every day
qh	every hour
q2h	every 2 hours
q3h	every 3 hours
qid	four times a day
qod	every other day
qs	quantity sufficient
R	rectal
Rx	take
$\bar{s}$	without
SC, subq	subcutaneous
sig	label
SL	sublingual
sol	solution
sp	spirits
stat	immediately
supp	suppository
syr	syrup
tab	tablet
tid	three times a day
tinct, tr	tincture
U, u	unit
ung	ointment
x	times

OBJECTIVE 2

Identify legal implications for the practical nurse in relation to medication documentation.

One purpose of documenting medications is to provide a legal record. When administering medications, you are responsible for knowing the legal implications of documentation. Each aspect of medication administration requires documentation according to federal and state laws, as well as professional standards and facility policy. Through documentation, medical personnel are able to record the actions that were taken in a particular situation. Inaccurate or incomplete documentation of actions can result in legal penalties against you. It is essential for you to *constantly* be aware of changes in the documentation methods.

OBJECTIVE 3

Identify the documentation necessary when obtaining a medication.

The processing necessary to obtain a medication for patient use must also be documented. Each facility has a policy stating the method one should use to order medications for patients. Some facilities will have a pharmacy in their institution, and others will have arrangements with an outside pharmacy. Long-term care facilities may use several different pharmacies according to patient or physician preference. Remember, only the doctor can initiate orders for medication.

Nurses who obtain packages of controlled substances from the pharmacy must sign their name stating that they have received these medications. It may be necessary for a nurse to do this on the unit when the pharmacy brings the medication or to do so in the pharmacy. This provides a record of the package of controlled substances. Obtaining and signing for packages of controlled substances should only be done by a licensed nurse.

Frequently, in acute care settings such as hospitals, duplicate copies (carbon copies) are used to record the physician's orders. The copy can then be used to order medication from the pharmacy. Cards may be used in some institutions to initiate an order or to resupply medications. Whichever method is used, you must write that the action has been completed beside the order to let other staff members know you have ordered the medication.

OBJECTIVE 4

Identify the documentation necessary when giving a medication.

Once the order has been transcribed and filled, you must document the action of giving a medication. All medication must be administered and documented according to the "five rights."

- Patient's name
- Medication name
- Amount or dosage of medication given
- Time and date given
- Route given

Injections require that the specific location of the injection be recorded, also. The effects of any medication should be recorded in the nurse's notes, as well as the absence of expected effects. Additionally, the signature of the person administering the medication should be recorded.

- Document specific location of injections
- Record effects and absence of effects of medication
- Signature of person administering medication

WARNING: Medications that have not been documented are considered to have not been given.

Each facility has different forms and procedures to be used with documentation. A standard form is usually used with routine medications. This form may be initialed or marked when a dose has been given. There are also forms for stat, one-time, and prn orders. Medications that are given as needed should also have the reason and response to the medication recorded in the nurse's notes. Prior to giving any medication in a facility, you must be aware of the documentation policies.

Equal in importance to documenting that you have given a medication is documenting that you have NOT given a medication. Any medication that is ordered and not given should have the reason for the change documented as specified by the facility's policy. Generally, this includes documentation on the medication sheet and the nurse's notes. The facility's policies should also cover temporary "holding" for tests, such as a patient who is NPO for morning lab work. "Holding" means a medication is not given to a patient for a specified period or for a given reason. This information must be documented. For example, some facilities will have you circle the time the medication was to be given to indicate that the medication was not given to the patient.

WARNING Medications should be documented after the patient has taken the medication, NOT before.

Another responsibility of the practical nurse that must be documented when administering medications is patient teaching. According to legal standards of documentation, patient teaching that has not been documented, never occurred in the legal sense. When documenting patient teaching, you should

- First, document the teaching goals on the kardex or the chart.
- Then, in the nurse's notes, record a summary of the actual teaching that took place. The documentation concerning the information taught should be specific.
- Also, it is important to objectively note the patient's response to the teaching. Check for understanding by having the patient verbalize the instructions and demonstrate self-medication as possible.

The documentation of patient teaching acts as both a legal record and a communication tool that informs the staff of the patient's goals. Patient teaching should begin as soon as you start giving a patient medication.

OBJECTIVE 5

Match systems of giving medications with their definitions.

Various systems of giving medications are used. These systems include

- **Routine**—Medication that is to be given to the patient regularly
- **Standing**—Any order that provides standard protocol for possible or commonly occurring events in patient care, or may be specific for certain specialized care areas.
- **One-time only order**—These orders include instructions for a specific treatment or medication to be administered and not repeated. Occasionally combined with STAT orders. The most frequent one-time order is for pre-operative medication.

- **Stat order**—A medication which the patient needs for immediate need such as chest pain or convulsion.

- **PRN**—Is an order written to be given based on the patient need and requires nursing judgement to determine if the drug should be administered. The physician will specify the dosage range, time frame, and any other specifics to be considered in making these judgments.

- **Self-terminating**—These orders have specific time frames or the number of doses to be administered written in. It may be specified in terms of days, hours, or the number of times to be carried out.

Many facilities have separate areas on the medication record where these systems of giving medications are to be documented. You must become aware of the facility's form and use it properly.

OBJECTIVE 6

Identify steps necessary to transcribe medication orders.

As a practical nurse, you will work under the direction of physicians. The method physicians use to communicate their intentions to nurses and other health professionals is the chart. Once a physician has written an order for a medication on a chart, the first step necessary for the client to receive a medication has been completed. In many institutions, it is routine for you, the practical nurse, to then document the order onto a kardex and also onto medication sheets or cards.

- Receive chart with medication order from physician
- Document order onto kardex
- Document order onto medication sheets or cards

When transferring the information about the dosage ordered, you must be able to

- Transcribe the order as it has been written by the physician
- Clearly understand the meaning of the order

If you are unable to determine the content or the meaning of an order, you should contact the physician and clarify the order. Your transcription and documentation to other records must be both legible and accurate.

When documenting medications, you must be able to determine sufficient information for accurate records. The basic information that must be communicated regarding medication orders includes

- Name of the patient who is to receive the drug
- Name of the drug to be given to the patient
- Amount or dosage of drug to be given to the patient
- Route the drug is to be given
- Time and/or frequency with which the drug is to be given

This information constitutes the five rights. Some people like to refer to documentation as the sixth right, because, without it, the others would not exist in legal aspects. All of the information above must be available at any time during the process of administering medications.

The nurse is responsible for accurately reading the doctor's order and [illegible] writing the order accurately on the kardex and medication card/sheet. (Some facilities use cards, some use sheets, and some use both.) The process of transcribing medication orders is vital for the patient to receive the correct medication. Close attention must be paid to each step of this procedure to ensure complete accuracy.

Because various forms are used among facilities, you must become familiar with the one used in your facility. Facilities may also differ in symbols for noting orders. Some place a checkmark after an order, while others place a K or MS after the order to indicate that the order has been transcribed to the Kardex or has been transcribed to a medication sheet.

For clarification, a set of orders, which is used to transcribe and note orders, is made up of one or more orders that are grouped by a single signing by the physician.

OBJECTIVE 7

Identify assessment data to be included in a medication history.

To increase the accuracy of medication administration, facilities frequently use documentation forms for medication histories. A medication history includes the patient's allergies and medications the patient has been taking, such as long-term medications, over-the-counter medications, and prescription medications. Not only will the history include this information, it may also include an outline of the patient's understanding of present medications, routine of home administration, as well as other applicable information. The reason for obtaining a patient's history is to make it possible for the physician to select the best medications and to focus on the needs of the individual patient with regards to their typical use of medications.

A patient's medication history provides valuable information you should know before giving and when giving medications. It can lend understanding to the patient's response to a medication and provide a base for patient teaching. Frequently, the medication history is taken by the practical nurse during the admission process. When completing a medication history, you must use good interviewing skills and determine when yes/no questions are appropriate and when open ended questions are needed. If the patient is unable to answer your questions, this information may be obtained from a someone who lives with the patient and is familiar with his medication and health habits.

If a nurse is giving medication to a patient and did not take the history, then action should be taken to be familiar with the information contained in the history.

It is essential to know patient allergies before giving *any* medications. Any known allergy should be recorded on all patient records. This includes the chart, the medication sheet or card, and the nursing kardex.

EXAMPLE: Dr. Smith asks Norma Johnson, a 65-year-old patient, "Have you taken penicillin before?"
"Yes, I have," replied Ms. Johnson.
The doctor then proceeded to give Ms. Johnson penicillin, after which she immediately went into anaphylactic shock. Luckily, the medical personnel were able to resuscitate her.
Once she was able to speak again, the doctor asked Ms. Johnson, "I thought you said you had taken penicillin before?"

"Yes, I have, and the same thing happened before."

This story proves that questioning a patient requires skill in order to communicate with the patient properly.

OBJECTIVE 8

Identify procedures for documenting verbal and telephone orders.

Verbal and telephone orders are two forms of orders necessary in round-the-clock patient care. They must be used with caution and strict attention to detail. In verbal orders, the physician states dosage orders aloud in the presence of a licensed nurse. The nurse then writes the orders on a chart, and, after having been properly transcribed, the orders immediately go into effect.

WARNING As a student nurse, you must have a licensed nurse present to take and sign for actual verbal orders you receive.

When taking verbal orders over the telephone, you should have another person listen on an extension or have another person read the order to the physician after you have written it.

Protect yourself when taking verbal or telephone orders, by following the steps below:

1. Write down the order exactly as heard
2. Repeat the order back to the physician
3. Make sure the order has complete information for administration, including the time and date ordered
4. Document all appropriate information about the administration
5. Follow the five rights of drug administration
6. Have the physician co-sign the order within twenty-four hours

OBJECTIVE 9

Identify procedures for documenting standing orders.

Standing Orders are physician's orders that are kept on a patient care unit. Physician's develop "standing orders" to meet the needs of patients with certain characteristics. Standing orders are written—usually typed. Each standing order applies to particular types of patients and each is kept on file by a particular physician. Two of the more common needs that may be addressed by standing orders are treatment of constipation and treatment of mild pain, such as a headache. Like verbal and telephone orders, standing orders need to be checked for completeness and transcribed to the specific patient's chart accurately. Additionally, these orders need to be co-signed by the patient's physician within 24 hours.

The practical nurse bears the responsibility of using standing orders correctly in appropriate situations. Not all patients should receive the particular medication noted in the standing orders, even if they meet the stated criteria. The nurse must use all available information before implementing the order. In other words, don't depend solely on the criteria stated in the standing order to decide whether or not to give a patient that particular medication. If unsure about whether or not to give a patient a standing order medication, check with your charge nurse first.

OBJECTIVE 10

Identify documentation requirements for storage, use, and waste of controlled substances.

Federal law requires very accurate records covering the storage, use, and waste of controlled substances. Although there are many groups of drugs now considered controlled substances, narcotics are the largest group, and often this term is used in place of the term controlled substances. For example, medical personnel will refer to the controlled substances cabinet as the narcotics cabinet.

The law requires that controlled substances be stored in a locked cabinet. Frequently, they are kept under a double lock system. Records are kept to verify the number of controlled substances used. A complete count of all controlled substances is taken at the beginning and at the end of each shift to certify that usage has been documented. (This procedure is detailed in the Unit 3, "Classifications and Effects of Medications.") Each time a person obtains a dose of these medications, the records must be completed with the following information:

- Patient
- Date and time
- Medication
- Amount
- Person ordering

- Person administering
- Number remaining in the container

This basic information is required on most controlled substance usage forms.

In addition to recording medications that have been given, controlled substances that have not been given to the client, and have therefore been wasted, must also be recorded. The same information needed for usage documentation should be included, plus a reason for the waste. Additionally, the signature of a witness to the wastage should be included on the form.

ASSIGNMENT SHEET 1

DOCUMENT MEDICATIONS

II

OBJECTIVE 11

Interpret written medication orders.

NAME ______________________________ SCORE ______

INTRODUCTION

The practical nurse must be able to interpret medication orders, as well as copy them accurately. The ability to read a variety of handwriting styles is crucial when interpreting written orders. All medication orders must include the basic information to fulfill the five rights. If the order is illegible or incomplete, you should contact the physician to clarify the order.

This assignment sheet will give you practice in reading various handwriting styles and interpreting the meaning of the written medication orders. Most charts are stamped with the patient's name; therefore, this information will not be covered in this assignment sheet.

DIRECTIONS

Write out, using no abbreviations, the meaning of the following written orders. If you are unsure of the meaning, write questions following the order.

1. Digitoxin 0.15 mg po qd

2. Dalmane 30 mg po HS prn sleep

3. Regular Humulin 28 u q am

4. Codeine gr 1/4 IM q6h prn

5. Nitroglycerin gr 1/150 SL q5min X 3 prn chest pain

ASSIGNMENT SHEET 2

DOCUMENT MEDICATIONS

OBJECTIVE 12

Transcribe medication orders.

NAME ______________________________ SCORE _______

DIRECTIONS

Obtain documents listed from instructor. Use the following procedure to transcribe medication orders.

DOCUMENTS NEEDED

- Physician's order sheet with medication order (should include p.o., subq, IM, ID, suppository prn., routine, stat and one-time orders)
- Kardex
- Medication card and/or sheet
- Pens

1. Read the medication orders on the physician's order sheet.
2. Check the completeness of the order.
    a. Name of patient
    b. Room number
    c. Name of drug
    d. Route of drug
    e. Dosage
    f. Frequency of administration
    g. Time(s) of administration (by policy for f.)
    h. Special instructions
3. If the information is incomplete, notify the charge nurse (instructor).
4. Write each complete order onto the Kardex in the correct location.
5. Check that the Kardex is exactly the same as the original order.

6. Write each complete order onto the medication card/sheet in the appropriate location.

7. Check that the medication card/sheet is the same as the original order.

8. Place appropriate symbol(s) by each order you transcribe.

9. Draw a single line through any blank spaces after each order within the set of orders.

10. When all orders have been transcribed, place "noted," the date, the time, and your signature after each set of orders.

EXAMPLE: Noted
11-28-88
9OOA
Jane Johnson

ASSIGNMENT SHEET 3 DOCUMENT MEDICATIONS

OBJECTIVE 13

Document administration of medication.

NAME ______________________________ SCORE ______

INTRODUCTION

As a practical nurse, you may give all forms of medication. All medication documentation must include

- Patient's name
- Medication name
- Amount (dosage) given
- Date and time given
- Route used

In addition to this information, the nurse who gave the medication must sign the documentation form, taking responsibility for that particular dose of the medication.

The various forms of medication differ only slightly in what is required in documentation. Oral medications and suppositories require only the basic five, while injections require the addition of the specific site of the injection, as well as the basic five.

DIRECTIONS

Using a form from your local facility, document that you gave the following medications to one patient, Mr. Asa Brown, on today's date.

1. 7:30 a.m. NPH insulin 34 units, in the right upper arm subcutaneous injection.
2. 8:00 a.m. and 12:00 p.m. Tagamet 300 mg. p.o. with meals
3. 9:00 a.m. Digoxin 0.125 mg. p.o. apical pulse rate = 72
4. 9:00 a.m. Catapres 0.1 mg p.o. held BP 90/44 (physician notified discontinued order)
5. 10:30 a.m. Demerol 50 mg. IM in left gluteus medius for pain in back relief in 1 hour

6. 11:00 a.m. Vistaril 50 mg. IM as one-time order for nausea relief in 30 minutes
7. 12:00 p.m. Heparin 5,000 units subq in left lower abdomen
8. 2:00 p.m. PPD 0.05 ml ID in left forearm
9. 2:30 p.m. Dulcolax supp.
10. 3:00 p.m. ASA gr. X p.o. for headache relief at 3:30 p.m.

ASSIGNMENT SHEET 4

DOCUMENT MEDICATIONS

OBJECTIVE 14

Complete patient assessment data to be included in a medication history.

NAME ______________________________ SCORE _______

INTRODUCTION

In this assignment sheet, you will practice writing questions that you would ask to obtain medical information. You will also practice obtaining a medication history by interviewing one of your classmates. You may want to use yes/no or open-ended questions.

Part I

DIRECTIONS

Write questions that would provide you with the best answers about the general information listed.

1. Determine any medications the patient is currently taking. This should include both over-the-counter and prescription medications.

   ____

   ____

   ____

2. Determine the schedule on which the patient has been taking the medications at home.

   ____

   ____

   ____

3. Determine the patient's understanding of the purpose of each medication.

   ____

   ____

   ____

4. Determine whether the patient has brought any medications from home. (Follow policy for storage of any medications.)

5. Determine any medications the patient may have been taking for a prolonged period of time.

6. Determine any known allergies the patient has to medication or food.

7. Determine medications that are effective or ineffective for the patient.

Part II

DIRECTIONS

Interview one person using the questions you have written. Follow the instructor's directions for specifics. Once the interview has taken place, use the following space to comment on how the questions could be improved.

ASSIGNMENT SHEET 5

DOCUMENT MEDICATIONS

OBJECTIVE 15

Document verbal and telephone orders.

NAME ______________________________ SCORE _______

DIRECTIONS

In this assignment sheet, you will listen to orders read by the instructor or played on a tape and document the orders as they are received.

PHYSICIAN'S ORDER SHEET

Carmel Brown
ID 100-001

Allergies: NKA

Date & Time	Order
	1.
	2.
	3.
	4.
	5.
	6.

ASSIGNMENT SHEET 6

DOCUMENT MEDICATIONS

II

OBJECTIVE 16

Document standing orders.

NAME ______________________________ SCORE ______

DIRECTIONS

Read the following case studies and determine which of the standing orders should be implemented. Also, determine the correct action to take if the order is not implemented. Your instructor may need to help you complete this assignment.

1. Mrs. Casey, a 72-year-old woman, is a patient of Dr. M. She was admitted to your hospital for abdominal pain of unknown origin. She has been in the hospital for 2 days. She complains of pain in her lower abdomen and says she has not had a bowel movement in 4 days. She has requested a laxative. Dr. M has the following standing orders:

   Tylenol 10 mg. po q6h prn mild pain or fever
   MOM 30 cc qd prn constipation
   Demerol 50 mg. q4h prn severe pain

   What action would you take?

   ____

   ____

   ____

   ____

2. Mr. Hall, a 48-year-old man, is a patient of Dr. K. He was admitted to your hospital for a fractured femur. He has been in the hospital 6 days. He is in traction. He complains of having an intermittent painful pulling feeling in his leg. You have done a neurovascular check, which was normal, and his traction is aligned and functioning correctly. It is 2 a.m. and Dr. K has the following standing orders for orthopedic patients:

   Ascriptin 10 mg. po q6h prn mild pain or fever
   Tylenol #3 ii tabs q4h prn severe pain
   Dalmane 30 mg. po HS prn sleep
   Valium 5 mg po tid muscle spasms

What action should you take?

____

____

____

____

3. **Mrs. Babb, a 28-year-old woman, was admitted as a patient in your hospital for thrombophlebitis. She is complaining of pain in her legs. She is receiving heparin IV in her right arm. She has no pain medication ordered. Her doctor has the following standing orders:**

   Demerol 50 mg. IM q6h for severe pain
   Aspirin ii tabs q4h prn mild pain

   What action should you take?

____

____

____

____

ASSIGNMENT SHEET 7

DOCUMENT MEDICATIONS

II

OBJECTIVE 17

Document the storage, use, and waste of controlled substances.

NAME ______________________________ SCORE ______

DIRECTIONS

Write the following doses of controlled substances, placing the information in the correct area on the controlled substance usage record on the following page. Make a note of the drugs that require waste, and document the amount of the waste on wastage forms.

Dr. Smith's patients.

1. Jane Baker—Demerol 75 mg IM at 7:55 a.m. on 1/1/9- Dose on hand = 75 mg/cc
2. Hugh Tebone—Morphine 6 mg IM at 8:30 a.m. on 1/1/9- Dose on hand = 10 mg/cc
3. Pamela Seibel—Percodan tabs ii p.o. at 9:00 a.m. on 1/1/9-
4. Jack Brown—Tylenol #3 i tab p.o. at 11:35 a.m. on 1/1/9-
5. Leroy Zarzour—Valium 5 mg IM at 1:20 p.m. on 1/1/9- Dose on hand = 10 mg/2cc

NOTE: Read the on hand dosage of each drug, and record each tablet on an individual line.

Controlled Substance Usage Record

Date & Time	Patient	Medication	Dosage	Physician	Signature

ASSIGNMENT ANSWERS — DOCUMENT MEDICATIONS — II

ASSIGNMENT SHEET 1

1. Digitoxin 0.15 milligrams by mouth every day.
2. Dalmane 30 milligrams by mouth at hour of sleep as needed for sleep.
3. NPH Humulin 28 units every morning.
4. Codeine grains 1/4 intramuscular every 6 hours as needed.
5. Nitroglycerine grains 1/150 sublingual every 5 minutes up to 3 times as needed for chest pain.

ASSIGNMENT SHEET 2

Answers will vary, but student should have

1. Read physician's orders
2. Checked for completeness
3. Notified correct person for incompleteness
4. Wrote complete order on Kardex
5. Checked Kardex with original order
6. Wrote complete order on medication card/sheet
7. Checked medication card/sheet with order
8. Placed correct symbol by each order
9. Drew single lines through all spaces
10. Signature, date, and time after each set of orders

In addition, make sure that

1. All writing is legible
2. Transcription is accurate
3. All necessary forms are completed and correct

ASSIGNMENT SHEET 3

Answers will vary according to exercises provided to the students.

ASSIGNMENT SHEET 4

Answers will vary according to input from students.

Part I—To satisfaction of instructor prior to completion of Part II.

Part II—To satisfaction of instructor.

ASSIGNMENT SHEET 5

Make tape of verbal and telephone orders with different voices reading the following orders. The patient's name, Carmel Brown, should be indicated before each order.

8/13	9:00 p.m.	1. Keflex 500 mg. po qid for 10 days begin now
8/13	11:15 p.m.	2. Haldol 2 mg im stat repeat times 1 if needed
8/14	6:00 a.m.	3. Hold a.m. does of digoxin this a.m.
8/15	5:30 a.m.	4. Increase NPH insulin to 35 units today
8/15	12:45 p.m.	5. Vistaril 50 mg. IM stat and q4h prn for nausea
8/16	4:30 p.m.	6. Benadryl 25 mg. po tid prn itching

ASSIGNMENT SHEET 6

1. None of the standing orders should be implemented. The physician should be called. Pain medication may mask significant symptoms and MOM may aggravate the cause of a GI problem.

2. Mr. Hall is having muscle spasms and Valium would be the drug of choice with this situation. Careful assessment of relief and continued neurovascular checks would be necessary.

3. Assess for severity of pain. No aspirin should be given to this patient and if the pain is not severe, the physician should be called for other orders.

ASSIGNMENT SHEET 7

To the satisfaction of instructor. Note wastage necessary with morphine. Standard dose 10 mg, 4 mg will be wasted.

JOB SHEET 1

DOCUMENT MEDICATIONS

II

OBJECTIVE 18 **Count controlled substances.**

INTRODUCTION

Because many regulations concerning controlled substances exist, accurate records must be kept on the use of medications. In health facilities, practical nurses are frequently required to count the narcotics at the change of shift. This counting provides a routine check of the use of controlled substances within a reasonable time frame.

Variations in the ways that controlled substances are handled can also be found. Some facilities may place facility controls on certain drugs because of the high misuse of them. This control method is frequently seen in the counting of antibiotics in nursing homes since they are difficult to keep without controls. Generally, the drugs that are counted are those designated by the FDA for this control measure. Again, facilities vary, making it the nurse's responsibility to adhere both to the laws and their facility's policies.

EQUIPMENT AND SUPPLIES

- Controlled substance folder (may vary with agency)
  Sign out sheets for several substances
  Count record sheet
- Locked box, cabinet or drawer
- Key(s) 2 keys required by many agencies
- Sample containers of controlled substances
  - Multidose bottles
  - Unit dose packages
  - Ampules
  - Liquid medications
- Two participants
  - one representative of off-going shift
  - one representative of on-coming shift

PROCEDURE

Both the off-going shift nurse and the on-coming shift nurse must be present before count begins.

Off-going shift	On-coming shift
1. Unlock controlled substance cabinet	1. Obtain controlled substance folder
2. Read controlled substance folder for number recorded as on hand for each substance	2. Count each substance
3. Count each substance	3. Read controlled substance folder for number recorded as on hand for each substance
4. Verbally state number on hand	4. Verbally confirm number on hand
5. If count differs a. Recount b. Look at options for patients that may have received medications c. Check with each staff member for possible error d. Follow facility policy if unable to locate e. Document correction and/or action for correction	5. If count differs a. Recount b. Accept as correct only after corrections are documented
6. Verify all substances stored correctly	6. Verify all substances stored correctly
7. Document count as correct	7. Document count as correct
8. Give keys to on-coming shift	8. Accept keys from off-going shift

PRACTICAL TEST 1

DOCUMENT MEDICATIONS

JOB SHEET 1

Demonstrate the ability to count controlled substances.

Student's name ____________________________ Date ___________

Evaluator's name __________________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

EQUIPMENT AND SUPPLIES

- Controlled substance folder (may vary with agency)
  - Sign out sheets for several substances
  - Count record sheet
- Locked box, cabinet or drawer
- Key(s) 2 keys required by many agencies
- Sample containers of controlled substances
  - Multidose bottles
  - Unit dose packages
  - Ampules
  - Liquid medications
- Two participants
  - one representative of off-going shift
  - one representative of on-coming shift
  -

Student:	Yes	No
Off-going Shift		
1. Unlocked controlled substance cabinet	_____	_____
2. Read controlled substance folder for number recorded as on hand for each substance	_____	_____
3. Counted each substance	_____	_____
4. Verbally stated number on hand	_____	_____
5. If count differed		
a. Recounted	_____	_____
b. Looked at options for patients that may have received medications	_____	_____
c. Checked with each staff member for possible error	_____	_____
d. Followed facility policy if unable to locate	_____	_____
e. Documented correction and/or action for correction	_____	_____
6. Verified all substances stored correctly	_____	_____
7. Documented count as correct	_____	_____
8. Give keys to on-coming shift	_____	_____

Student:	Yes	No
On-coming Shift		
1. Obtained controlled substance folder	_____	_____
2. Counted each substance	_____	_____
3. Read controlled substance folder for number recorded as on hand for each substance	_____	_____
4. Verbally confirmed number on hand	_____	_____
5. If count differed		
a. Recounted	_____	_____
b. Accepted as correct only after corrections are documented	_____	_____
6. Verified all substances stored correctly	_____	_____
7. Documented count as correct	_____	_____
8. Accepted keys from off-going shift	_____	_____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Counted controlled substances				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

_______________ (Date)

_______________ (Evaluator's Signature)

_______________ (Evaluator's Position)

WRITTEN TEST

DOCUMENT MEDICATIONS

II

NAME ______________________________ SCORE ______

OBJECTIVE 1

Match the common symbols and abbreviations used in the documentation of the administration of medication to their correct meanings. Write the letter of the correct answer in the blanks provided.

___ 1. By means of
___ 2. Capsule
___ 3. Immediately
___ 4. Every other day
___ 5. Four times a day
___ 6. Normal saline
___ 7. Left eye
___ 8. Of each
___ 9. Label
___ 10. Right eye

a. cap
b. NS
c. OD
d. sig
e. stat
f. aa
g. /
h. qid
i. OS
j. qod
k. dram
l. u
m. Tid
n. aq
o. sol
p. fl

OBJECTIVE 2

Identify legal implications for the practical nurse in relation to medication documentation. Write the letter of the correct answer in the blank provided.

____1. Documentation of medications is required by

- a. federal law
- b. state law
- c. professional standards and facility policy
- d. all of the above

____2. The method you should use to provide a legal record of administering medications is

- a. certified forms
- b. legal medical forms provided by your lawyer
- c. documentation
- d. always having witnesses present

OBJECTIVE 3

Identify the documentation necessary when obtaining a medication. Write the letter of the correct answer in the blank provided.

____1. To order medications, you should follow the facility's policy on ordering medications. Who must initiate orders for medication?

- a. pharmacist
- b. nurse
- c. doctor
- d. patient

____2. If you are unable to read an order, you should

- a. call the physician
- b. put the order on hold
- c. refuse to carry out the order
- d. transcribe the parts that are legible

OBJECTIVE 4

Identify the documentation necessary when giving a medication. Write the letter of the correct answer in the blank provided.

___ 1. When giving an injection, what additional information must be documented?

- a. reason for injection
- b. specific location of injection
- c. both a and b
- d. none of the above

___ 2. After administering a prn medication, which of the following is routinely recorded in the nurse's notes, but not in the medication administration form?

- a. route of medication
- b. time of medication
- c. name of medication
- d. effects of medication

___ 3. When should administration of medication be documented?

- a. when preparing the medication
- b. when planning to give routine medications
- c. immediately after giving medication
- d. at the end of the shift

___ 4. What should be written in the nurse's notes when a medication is "held?"

- a. where medication is being held
- b. expected time of administration
- c. reason for hold
- d. documentation is not necessary

____5. Where should patient teaching be documented?

- a. nurse's notes
- b. medication sheets
- c. doctor's orders
- d. progress sheets

____6. When should patient teaching about medications begin?

- a. when first medication is given
- b. when patient shows interest
- c. after effects of medication are seen
- d. immediately before discharge

OBJECTIVE 5

Match systems of giving medications with their definitions. Write the letter of the correct answer in the blank provided.

____1. Medication given to patients to meet an immediate need

____2. Medication that is to be given to the patient at a specified interval as needed.

____3. Medication to be given to patients for situations such as pre-operatively or for tests

____4. Medication that is to be given to the patient regularly

- a. routine
- b. amt
- c. prn
- d. one-time
- e. stat doses
- f. OS
- g. OD

OBJECTIVE 6

Identify steps necessary to transcribe medication orders. Write the letter of the correct answer in the blank provided.

___ 1. When transferring the information about the dosage ordered, you must be able to

a. transcribe the order as it has been written by the physician

b. clearly understand the meaning of the order

c. both a and b

d. none of the above

___ 2. During the process of administering medications, which of the following must be available at all times?

a. Name of the patient who is to receive the drug

b. Amount or dosage of drug to be given to the patient.

c. Route the drug is to be given

d. All of the above

___ 3. If the nursing staff is unable to determine the meaning of an order, the person to contact is the

a. Charge nurse

b. Physician

c. Medical records department

d. Pharmacist

OBJECTIVE 7

Identify assessment data to be included in a medication history. Write the letter of the correct answer in the blank provided.

___ 1. Which information is necessary on a medication history?

a. Allergies

b. Over-the-counter medications

c. Prescription medications

d. All of the above

____2. The reason for obtaining a medication history is to

a. allow the physician to choose the best medication for the patient

b. allow the nurse to become more familiar with the patient

c. to make the patient feel at ease

d. None of the above

____3. Which question would provide the best information for a medication history?

a. What time do you take your medication?

b. Are you currently taking any prescription medication?

c. What do you know about your medication?

d. Do you feel your medication is working?

OBJECTIVE 8

Identify documentation requirements for verbal and telephone orders. Write the letter of the correct answer in the blanks provided.

____1. Verbal orders may be taken by a

a. student nurse

b. family member

c. nursing assistant

d. licensed nurse

____2. A verbal order must be co-signed by the physician within

a. 24 hours

b. 2 hours

c. 12 hours

d. none of the above

___ 3. The physician should co-sign a telephone order within

a. 24 hours

b. 2 hours

c. 12 hours

d. none of the above

___ 4. The next step after recording a telephone order on the chart is to

a. have the physician sign it

b. have some other person repeat it back to the physician calling

c. have the charge nurse check it

d. administer the medication immediately

OBJECTIVE 9

Identify documentation requirements for standing orders.
Write the letter of the correct answer in the blanks provided.

___ 1. An aspect of a medication on a standing order to be considered with special caution is/are the

a. contraindications

b. generic name

c. action

d. route of medication

___ 2. The basic nursing principle most necessary when determining the use of standing orders is

a. assessment

b. planning

c. implementation

d. documentation

____3. When using a standing order

a. the physician must be contacted first

b. it must be checked off on the medical information board

c. the physician must sign the order within 24 hours of its use

d. none of the above

____4. When unsure about implementing a standing order, you first should check with

a. the pharmacy

b. the physician

c. the charge nurse

d. none of the above

OBJECTIVE 10

Identify documentation requirements of storage, use, and waste of controlled substances. Write the letter of the correct answer in the blanks provided.

____1. Controlled substances are counted

a. at the end of every shift

b. at the beginning of each shift

c. both a and b

d. none of the above

____2. Controlled substances should be kept

a. in the pharmacy

b. in a locked cabinet

c. in the nurse's pocket

d. in the patient's medication drawer

NOTICE The following assignment sheets and job sheet are not a part of the written test. If these activities have not been completed, check with your instructor.

OBJECTIVE 11	**Interpret written medication orders.**	SCORE ____
OBJECTIVE 12	**Transcribe medication orders.**	SCORE ____
OBJECTIVE 13	**Document administration of medication.**	SCORE ____
OBJECTIVE 14	**Complete patient assessment data to be included in a medication history.**	SCORE ____
OBJECTIVE 15	**Document verbal and telephone orders.**	SCORE ____
OBJECTIVE 16	**Document standing orders.**	SCORE ____
OBJECTIVE 17	**Document the storage, use and waste of controlled substances.**	SCORE ____
OBJECTIVE 18	**Demonstrate the ability to count controlled substances.**	RATING ____

WRITTEN TEST ANSWERS

DOCUMENT MEDICATIONS

II

OBJECTIVE 1

1. g
2. a
3. e
4. j
5. h
6. b
7. i
8. f
9. d
10. c

OBJECTIVE 2

1. d
2. c

OBJECTIVE 3

1. c
2. a

OBJECTIVE 4

1. b
2. d
3. c
4. c
5. a
6. a

OBJECTIVE 5

1. e
2. c
3. d
4. a

OBJECTIVE 6

1. c
2. d
3. b

OBJECTIVE 7

1. d
2. a
3. c

OBJECTIVE 8

1. d
2. a
3. a
4. b

OBJECTIVE 9

1. a
2. a
3. c
4. c

OBJECTIVE 10

1. c
2. b

OBJECTIVES 11-17 Refer to answers to Assignment Sheets 1 through 7.

OBJECTIVE 18 Refer to Practical Test for Job Sheet 1.

OBJECTIVE SHEET

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

III

INTRODUCTION

Administration of medications is one of the most important dependent interventions that the Licensed Practical Nurse will perform. In order to analyze the assessment data and determine patient needs as well as evaluate the effectiveness of medications, the nurse must have a sound knowledge base about medications and the classifications of drugs.

Nurses must be aware of how patients and drugs relate and react to one another. Careful on-going assessment of the patient along with a good knowledge of drugs will help to ensure the effective use of medications in health care. The assessment of the patient in terms of the effect of each drug is an essential and continual process and should be the priority to anyone administering medications.

When administering medications or working with patients on medication, the practical nurse will often need to assess the patient's need for medication, present patient instruction in relation to specific drugs, and constantly evaluate the effectiveness of all medications. To apply the total nursing process as it relates to medications, a practical nurse must be well aware of the classifications and various effects of medications.

UNIT OBJECTIVE

After completing this unit, the student should be able to apply the nursing process to the administration of medications. The nurse will be able to locate and relate information regarding the classifications and effects of medications. The student will demonstrate these competencies by completing assignment sheets and written tests with a minimum of 85 percent accuracy.

PREREQUISITES

Before studying this unit the student should have completed study of units "Calculate Medication Dosage" and "Document Medication."

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Match terms used in the description of medications with their correct definitions.

2. Identify ways that drugs are classified.
3. Identify general purposes for which medications are given to patients.
4. Differentiate between systemic and local effects of medications.
5. Identify therapeutic actions of the most common classes of medications.
6. Identify side effects of the common classifications of medications.
7. Identify contraindications of the common classifications of medications.
8. Identify common drugs within each classification of medication.
9. Identify the nursing implications for common classification of medications.
10. Identify drug factors and patient assessment data which influence selection and administration of medication.
11. Identify trade and generic names of medications. (Assignment Sheet 1)
12. Use references to obtain information about drugs. (Assignment Sheet 2)
13. Develop patient instruction on medication. (Assignment Sheet 3)

SUGGESTED ACTIVITIES

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

III

PREPARATION

Order materials to supplement unit.

- Film, videotape, and other media
- Literature—*Essentials of Pharmacology for Health Occupation*, John Wiley and Sons, 1987
- *Medications and Mathematics for the Nurse*, 6th edition, Delmar Publishers, Inc. 1988
- *Physicians Desk Reference*

DELIVERY

Objective 1

- Discuss how each term is used.
- Show examples of how each term is used in references.
- Have students identify terms with similar and opposite meanings.

Objective 2

- Discuss ways drugs are classified, give examples.
- Discuss sources of drugs, Supplement 1.

Objective 3

- Have students provide examples of each purpose.
- Discuss the research involved in seeking a drug for a particular purpose.
- Let students identify the purpose of unfamiliar drugs if given specific purposes.

  EXAMPLES: Labetol—hypertension treatment.
- Discuss diseases from the past that are today controlled by drugs, such as polio, measles, mumps, small pox, etc.
- Discuss new drugs being developed for a particular purpose, such as AIDS, cancer, birth control.
- Read Supplement 2.

Objective 4

- Provide examples of local and systemic effects.
- Discuss relationship between systemic effects, therapeutic effects and side effects.
- Have students look on client's charts for blood levels of medications such as digoxin or theophylline. Discussion may also include discussion of PT and PTT for anticoagulant therapy and therapeutic range evidenced by other tests.
- Discuss the drugs which are given in the local facility using load (initial) doses of medication.
- Have students observe the effects of initiating a new medication on a patient for a period of several days.
- Records may be kept to indicate using observable changes when the therapeutic effects of the medication began.
- The students can observe the effects of blood level in a shorter span of time through close observation of patients being medicated for pain. Relate the differences in medications by purpose and effects.

Review information charts for Objectives 5 through 9

- Discuss the information and indicate the areas you feel are most important.
- Provide practice drills in the major categories.
- Use chart information in adaptation of Trivial Pursuit.
- Have students provide examples of each purpose for which medications are given to patients.

Objective 10

- Have students work in groups to identify factors which impact ideas on Assignment Sheet 3.
- Use patients in the clinical area as individual case studies for identification of factors which influence medication selection.
- Discuss drug factors and examples of how each affects choice.

- Have students work in small groups to choose medications for a patient, provide information about particular needs and limitations.

APPLICATION

Objective 11

- Give the name of drugs used in your local facilities.
- Have teams cross quiz each other on generic and trade names.
- Discuss unusual additives that may make differences in the listing of a generic drug.

  EXAMPLE: Hydroxyzine pamoate—hydroxyzine hydrochloride.

- Compete Assignment Sheet 1.

Objective 12

- Discuss the chart and indicate the areas you feel are most important.
- Provide practice drills in the major categories.
- Using the chart, devise a "Trivial Pursuit" game, and have the class quiz each other in groups.
- Designate the resources to be used to complete Assignment Sheet 2.
- Read Supplements 5 and 6.
- Discuss the PDR, and give students the clue to "think pink" to find medications by trade name.
- Stress importance of using current references.

Objective 13

- Review patient and drug factors to be considered.
- Complete Assignment Sheet 3.
- Have students role play delivery of information.

EVALUATION

Pretest

- Pretest qualifying students.
- Determine individual study requirements from pretest results.

- Counsel students individually on pretest results and study requirements.
- Modify materials in unit or create supplementary material for individual students as required.

Written Test

- Explain to students that they will be asked to demonstrate on the written test the actions listed in specific objectives
- Give written test

  NOTE: The written test may be given in sections if desired.
- Evaluate students on Assignment Sheet situation if not previously done.
- Reteach and retest if necessary.
- Complete appropriate section of competency profile.
- Review individual and group performance in order to evaluate teaching methods. Adjust scope, sequence, or institutional approaches for additional lessons as required.

SUGGESTED RESOURCES

Publications

- Bayt, Phyllis Theiss, *Administering Medications: A Competency-Based Program for Health Occupations.* The Bobbs-Merrill Company, Inc. 1982.
- Clayton, Bruce D., Yvonne N. Stock, and Jessie E. Squire, *Squire's Basic Pharmacology for Nurses.* 8th Edition, C.V. Mosby Company. 1985.
- Julien, Robert M., *Drugs and the Body*, W.H. Freeman and Company, 1988.
- Rice, Jane and Esther G. Skelley, *Medications and Mathematics for the Nurse*, 6th Edition, Delmar Publishers, Inc. 1988.
- Woodrow, Ruth, *Essentials of Pharmacology for Health Occupations*, John Wiley and Sons, Inc. 1987.

UNIT REFERENCES

Publications

- Bayt, Phyllis Theiss, *Administering Medications: A Competency-Based Program for Health Occupations*. The Bobbs-Merrill Company, Inc. 1982.
- Clayton, Bruce D., Yvonne N. Stock, and Jessie E. Squire, *Squire's Basic Pharmacology for Nurses*. 8th Edition, C.V. Mosby Company. 1985.
- Julien, Robert M., *Drugs and the Body*, W.H. Freeman and Company, 1988.
- Musser, Ruth D., and John J. O'Neill, *Pharmacology and Therapeutics*, 4th Edition, 1969.
- Rice, Jane and Esther G. Skelley, *Medications and Mathematics for the Nurse*, 6th Edition, Delmar Publishers, Inc. 1988.
- Woodrow, Ruth, *Essentials of Pharmacology for Health Occupations*, John Wiley and Sons, Inc. 1987.

PRETEST ANSWERS

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

III

OBJECTIVE 1

1. a
2. g
3. i
4. j
5. m
6. p
7. r
8. c
9. e
10. k
11. l
12. d
13. f

OBJECTIVE 2

1. d
2. b
3. c
4. a

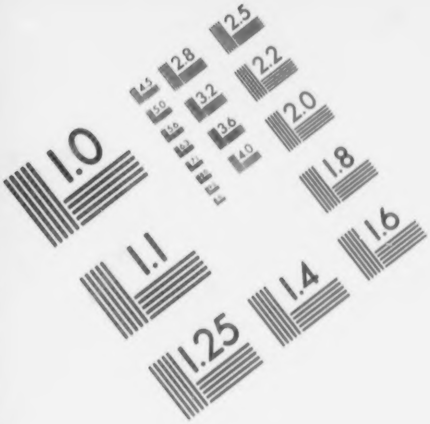
OBJECTIVE 3

1. d
2. c
3. b

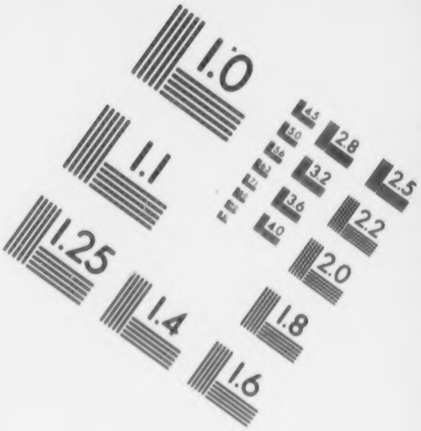
OBJECTIVE 4

1. a
2. b
3. a
4. c
5. b
6. d
7. c
8. c

TOP

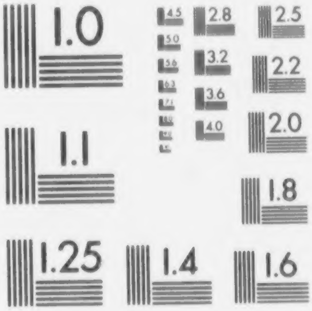

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6

Film Identification


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0

PRECISION℠ RESOLUTION TARGETS

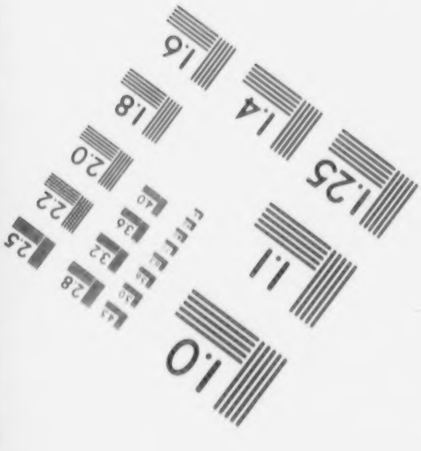
LEFT

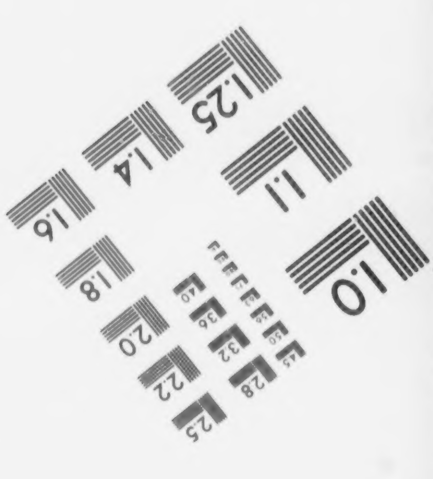

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
7.1
8.0
9.0
10

RIGHT

150 MM

6″


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0

PA-3 8½″x11″ PAPER PRINTED GENERAL TARGET

OBJECTIVE 5

1. d
2. b
3. a
4. d
5. a
6. a
7. c

OBJECTIVE 6

1. b
2. a
3. d
4. d

OBJECTIVE 7

1. a
2. b
3. d
4. c
5. c
6. b
7. a
8. c

OBJECTIVE 8

1. d
2. d
3. b
4. c
5. a

OBJECTIVE 9

1. b
2. a
3. b
4. c
5. a

OBJECTIVE 10

1. d
2. b
3. a

OBJECTIVES 11-13

Refer to answers to Assignment Sheets 1 through 3.

PRETEST

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

III

NAME ______________________________ SCORE _______

OBJECTIVE 1

Match terms used in the description of medications with their correct definitions. Write the letter of the correct answer in the blanks provided.

___ 1. Severe response to drugs

___ 2. An unexpected response to a medication

___ 3. Drug used for medical therapy

___ 4. The study of drugs

___ 5. Warning to use care when giving drugs under certain conditions

___ 6. Effects of drugs which prevent, diagnose, or treat diseases or conditions

___ 7. Dangerous effects of a drug caused by too much of the drug within the system

___ 8. Condition or reason that makes the use of a drug dangerous or ill-advised

___ 9. Chronic misuse of a drug

___ 10. The study of how drugs interact with body tissues

___ 11. An inactive substance resembling a medication that produces effects on the body because of the patient's belief in that effect

___ 12. A chemical that affects the body

___ 13. An inability on the part of a person to control the intake of a drug

a. Adverse effect

b. Anaphylaxis

c. Contraindication

d. Drug

e. Drug abuse

f. Drug dependence

g. Drug idiosyncrasy

h. Indications

i. Medication

j. Pharmacology

k. Pharmacodynamics

l. Placebo

m. Precaution

n. Side effects

o. Teratogenic effects

p. Therapeutic effects

q. Tolerance

r. Toxic effects

OBJECTIVE 2 **Identify ways that drugs are classified.** Identify the common classifications of drugs according to their accessibility by placing the correct terms in the spaces provided.

1. __________—Medication which may be purchased with no prescription
2. __________—Medications that requires a prescription because of the possible harmful effects the client may encounter if he takes the drug indiscriminately.
3. __________—Medication that requires a prescription because of the danger of the client abusing the drug or becoming addicted to the drug.
4. __________—Drugs that are illegal to use and must be obtained by illegal means.

a. Illegal
b. Legend
c. Controlled
d. Over-the-counter

OBJECTIVE 3 **Identify general purposes for which medications are given to patients.** Write the letter of the correct answer in the blank provided.

____1. Which purpose does administration of antibiotics serve?

a. prevention
b. treatment
c. diagnosis
d. cure

____2. Which purpose does administration of x-ray dye serve?

a. prevention
b. treatment
c. diagnosis
d. cure

___ 3. The majority of drugs available serve which purpose?

   a. prevention

   b. treatment

   c. diagnosis

   d. cure

OBJECTIVE 4

Differentiate between systemic and local effects of medications. Write the letter of the correct answer in the blank provided.

___ 1. Which of the following has the most localized effect?

   a. ointment for rash

   b. medication for headache

   c. cough syrup

   d. injection for nausea

___ 2. Which of the following classes of medications may have either primarily local or primarily systemic effects?

   a. analgesics

   b. anesthetics

   c. antibiotics

   d. anticoagulants

___ 3. A physician orders a medication to be given. The first dose is 3 times the amount that is normally given . Subsequent doses all fall within the normal range. What is the purpose of this order?

   a. attain therapeutic blood level

   b. increase the effectiveness of the drug

   c. test the patient's tolerance to the drug

   d. distinguish effects of medication from those presently being taken

____4. The patient has commented about taking 3 tablets of a new medication. This is the initial dose of the medication. Which is the best explanation to the patient?

a. "I've checked it and three is the correct number."

b. "This is the first dose so you have to take more."

c. "The first dose is more than you will receive later so that the medication can begin working sooner."

d. "This is a rather large dose of this medication. It is what the doctor ordered and I think it will do you good."

____5. Which level of medication produces the desired effect without harmful side effects?

a. load dose

b. therapeutic

c. toxic

d. lethal

____6. Which level of medication produces death?

a. load dose

b. therapeutic

c. toxic

d. lethal

____7. Which of the following medications is commonly monitored for desired blood level?

a. aspirin

b. penicillin

c. theophylline

d. phenergan

__ 8. Which of the following medications is commonly monitored for the correct maintenance dose?

a. aspirin

b. penicillin

c. digoxin

d. lasix

OBJECTIVE 5

Identify therapeutic actions of the most common classes of medications. Write the letter of the correct answer in the blank provided.

__ 1. Which classification is used for pain relief?

a. adrenergics

b. antipruritics

c. emetics

d. analgesics

__ 2. Which classification is used to cause urination?

a. CNS stimulants

b. diuretics

c. insulin

d. laxatives

__ 3. Which of the following is achieved by a hypnotic?

a. produce sleep

b. treat depression

c. dilate pupils

d. reduce fever

____4. Which of the following is achieved by an antipyretic?

a. produce sleep

b. treat ulcers

c. dilate pupils

d. reduce fever

____5. A patient with edema would be most likely to receive which of these types of drugs?

a. Diuretics

b. Antacids

c. Steroids

d. Anticoagulants

____6. A patient with Parkinson's disease would most likely receive:

a. antiparkinsonian drugs

b. antineoplastic drugs

c. adrenergics

d. antispasmodics

____7. A patient going to surgery may receive all EXCEPT which of the following?

a. Sedative

b. Antiseptic wash

c. CNS stimulant

d. Antiemetic

OBJECTIVE 6

Identify side effects of the common classifications of medications. Write the letter of the correct answer in the blank provided.

___ 1. A frequent side effect of vasodilators is:

a. depression

b. hypotension

c. tinnitus

d. restlessness

___ 2. A frequent side effect of NSAID product is:

a. GI bleeding

b. CNS stimulation

c. Loss of sensation

d. edema

___ 3. Which of the following would be an idiosyncratic effect of CNS stimulants?

a. Changes in B/P

b. Nervousness

c. GI distress

d. Bradycardia

___ 4. Which classification does not usually cause prolonged bleeding time?

a. Antipyretics

b. Anticoagulants

c. NSAID

d. Adrenergics

OBJECTIVE 7

Identify contraindications of the common classifications of medications. Write the letter of the correct answer in the blanks provided.

____1. Which disease is a contraindication for estrogen therapy?

a. thrombophlebitis

b. dysmenorrhea

c. Alzheimer's disease

d. menopause

____2. Immediately after surgery a patient may receive all EXCEPT which of the following?

a. analgesic

b. anticoagulant

c. antibiotic

d. antiemetic

____3. Which medication should be discontinued several weeks before scheduled surgery?

a. analgesics

b. diuretics

c. hypoglycemics

d. anticoagulants

____4. Which classifications should be held if the heart rate is less than 60?

a. analgesics

b. antihistamines

c. cardiac glycosides

d. CNS depressants

___ 5. Which vital sign is most essential when administering narcotic analgesics?

a. temperature

b. pulse

c. respiration

d. blood pressure

___ 6. Two drugs which increase the action of each other when given together:

a. are antagonists

b. potentiate each other

c. are synergistic

d. none of the above

___ 7. Two drugs that counteract each other when given together

a. are antagonists

b. potentiate each other

c. are synergistic

d. none of the above

___ 8. Drugs that work together to produce an effect which neither would produce alone.

a. are antagonists

b. potentiate each other

c. are synergistic

d. none of the above

OBJECTIVE 8

Identify common drugs within each classification of medication. Write the letter of the correct answer in the blanks provided.

____1. Which classification includes furosemide?

a. Cardiac glycosides

b. Analgesics

c. Expectorants

d. Diuretics

____2. Which classification includes acetylsalicylic acid?

a. Antipyretic

b. NSAID

c. Analgesic

d. All of the above

____3. Which of the following drugs does not act as an anticoagulant?

a. Heparin

b. Acetaminophen

c. Acetylsalicylic acid

d. Coumadin

____4. Which drug is an anti-ulcer agent?

a. Aluminum hydroxide

b. Hexachlorophene

c. Cimetidine

d. Ibuprofen

___ 5. Which classifications are antagonistic?

a. Adrenergics and cholinergics

b. Antacids and anti-ulcer agents

c. Analgesics and antipyretics

d. Narcotics and hypnotics

OBJECTIVE 9

Identify nursing implications for common classifications of medications. Write the letter of the correct answer in the blanks provided.

___ 1. Your patient has been given antacids, you should:

a. Caution about using around machinery

b. Discuss over-the-counter use and compatibility with other medications

c. Monitor heart rate

d. Teach daily B/P monitoring.

___ 2. Your patient has been given tetracyclines, you should:

a. Remind patient to avoid dairy foods

b. Monitor diet therapy for bland diet

c. Instruct patient to avoid operating heavy machinery

d. Give with food

___ 3. Your patient has been given analgesics, you should:

a. Give with food

b. Monitor respiration

c. Give only with special training

d. Give at bedtime

____4. Your patient has been given antidiarrheal agents, you should:

a. Assess for cause of nausea

b. Discuss gas forming foods

c. Provide for adequate fluid intake

d. Monitor heart rate

____5. Your patient has been given oral hypoglycemics, you should:

a. Instruct on diet importance or regular dosage

b. Apply topically

c. Watch for allergic reactions

d. Apply aseptically

OBJECTIVE 10

Identify drug factors and patient assessment data which influence selection and administration of medication. Write the letter of the correct answer in the blanks provided.

____1. Which of the following patient factors must be considered when giving a medication?

a. Age

b. Weight

c. Attitude about drug

d. All of the above

____2. Which group generally would require the highest dosage of medication if all were normal size for age?

a. Middle aged women

b. Middle aged men

c. Elderly women

d. Elderly men

___ 3. Which aspect of a medication would have to be considered first in a patient who could not take medication by mouth?

a. Route of availability

b. Dependability of absorption

c. Rate of metabolism

d. Methods of excretion

NOTICE In addition to the pretest, the student will be required to demonstrate mastery of the following objectives.

OBJECTIVE 11 **Identify trade and generic names of medications.** SCORE ____

OBJECTIVE 12 **Use references to obtain information about drugs.** SCORE ____

OBJECTIVE 13 **Develop patient instruction on medication.** SCORE ____

INFORMATION SHEET

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION III

OBJECTIVE 1

Match terms used in the description of medications with their correct definitions.

- **Adverse effect**—Severe response to drugs
- **Anaphylaxis**—Severe, life-threatening allergic response
- **Contraindication**—Condition or reason that makes the use of a drug dangerous or ill-advised
- **Drug**—A chemical that affects the body
- **Drug abuse**—Chronic misuse of a drug
- **Drug dependence**—An inability on the part of a person to control the intake of a drug
- **Drug idiosyncrasy**—An unexpected response to a medication
- **Indications**—Reasons for a certain drug being used
- **Medication**—Drug used for medical therapy
- **Pharmacology**—The study of drugs
- **Pharmacodynamics**—The study of how drugs interact with body tissues
- **Placebo**—An inactive substance resembling a medication that produces effects on the body because of the patient's belief in that effect
- **Precaution**—Warning to use care when giving drugs under certain conditions
- **Side effects**—Drug induced effects other than the desired beneficial effects
- **Teratogenic effects**—Effects of a drug (or other agent) on the embryo or fetus caused when the drug crosses the placenta
- **Therapeutic effects**—Effects of drugs which prevent, diagnose, or treat diseases or conditions

- **Tolerance**—Property of some drugs in which the drug's effects decrease after repeated doses, therefore requiring an increase in the dosage amount necessary to obtain the desired effect
- **Toxic effects**—Dangerous effects of a drug caused by too much of the drug within the system

OBJECTIVE 2 **Identify ways that drugs are classified.**

Drugs are classified in various ways. Some methods of classification include:

- Drugs that have a principal action on the body, for example, analgesics, anti-diarrheal
- Drugs used to treat or prevent specific disease, for example,hormones, vaccines
- Drugs that act on specific organs or body systems, for example, cardiovascular drugs, gastrointestinal drugs.
- Forms of drug preparation, for example, solids or liquids.

Drugs are also classified according to the method the client uses to obtain them. The general drug classifications are listed below.

- **Over-the-counter** (OTC)—Medication which may be purchased with no prescription.

  WARNING: Use of over-the-counter medications must be discussed with the patient to avoid drug interactions and to provide the patient with adequate health information concerning the medication.

- **Prescription**—The Federal Food, Drug and Cosmetic Act requires that these drugs bear on the label the information on how the medication is to be taken

  WARNING: Federal Law prohibits dispensing without prescription. Examples include digoxin and penicillin.

- **Legend**—Medications, which are not controlled, requiring a prescription because of the possible harmful effects the client may encounter if he takes the drug indiscriminately.

- **Controlled substance**—Medication that requires a prescription because of the danger of the client abusing the drug or becoming addicted to the drug.
- **Illegal**—Drugs that are illegal to use and must be obtained by illegal means.

NOTE: You should be aware that one drug may be used to treat a variety of conditions. For example, a broad-spectrum antibiotic can be used to treat various types of infectious processes, or a diuretic may be used to exert an effect on the cardiovascular system or urinary system.

OBJECTIVE 3

Identify general purposes for which medications are given to patients.

Medications are given to clients for several reasons. Five of the most common general purposes include

- **Prevention**—Vaccines are an example of medications that are given to prevent disease.
- **Diagnosis**—Diagnostic medications have increased in number with the use of dyes for x-ray purposes.
- **Treatment**—Most drugs are used for treatment of the symptoms of disease. Medications that only relieve the symptoms without affecting the disease are referred to as palliative medications.
- **Replacements**—Replacement medications include vitamins and diet supplements, which keep the body healthy or improve general health.
- **Cure**—Some drugs provide treatment for symptoms while allowing the body to work on curing the disease or condition. One of the best examples of a curative medication is antibiotics for infections. The antibiotic itself, and not the human body, produces the cure.

OBJECTIVE 4

Differentiate between systemic and local effects of medications.

An important aspect to be aware of when giving a medication is the type of effect it has on the client. A medication may have one of two effects.

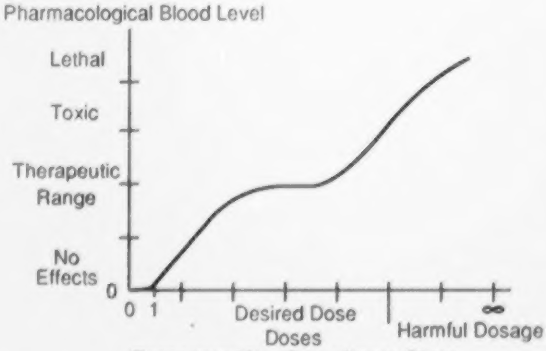
- **Systemic effect**—Regardless of where the medication enters the body, it affects the whole system.
- **Local effect**—The medication's effect is limited only to the area where it is administered.

Most medications have systemic effects, while a few, such as ointments, have a local effect. The generalized effects of medication are determined by the blood levels of the medication. The blood level of a medication or drug is the amount of medication being circulated within the body at any given time. This level ranges from no drug in the system to levels which are lethal and will cause death.

The desired blood level is the therapeutic level. This provides effects without severe side effects. The therapeutic level can also be called the maintenance dose of a medication. It may be necessary when beginning a medication to give higher doses then are normally given to reach the therapeutic blood level. This is called an initial or load dose of a medication. This allows the patient to experience the effects of the medication faster but must be carefully monitored to avoid side effects.

Anytime severe side effects are found the blood level of the medication has reached toxic effects. It is the nurses responsibility to observe and document the clients response to a medication because of the many individual factors which can affect drug metabolism. If the signs of drug toxicity are not recognized then a lethal level of drug may occur. Some drugs, such as digoxin and theophylline, are monitored by blood tests to verify that the blood level is within the therapeutic range. It is still necessary for the nurse to observe the individual client carefully.

The following diagram shows the effects of increasing blood levels of a drug.



OBJECTIVE 5 **Identify the therapeutic actions of the most common classes of medications.**

The practical nurse needs to be familiar with the expected outcome or the therapeutic actions of any drug administered to the patient in order to effectively evaluate the treatment plan. This information helps the practical nurse to know the specific patient data and essential information to be communicated to the physician in relation to the drug. This information also guides the practical nurse in documenting pertinent assessment data in the chart.

Refer to chart after page 34.

OBJECTIVE 6 **Identify the side effects of common classifications of medications.**

When administering drug therapy for any patient, one of the major roles for the practical nurse is to assess the patient for side effects of the drugs. As a vital member of the health care team the bed-side nurse will be the first to detect adverse or toxic reactions to medications. Communications and documentation of this assessment data provide the health care team with needed information to adjust the treatment plan.

Refer to chart after page 34.

OBJECTIVE 7 **Identify contraindications of the common classifications of medications.**

The practical nurse often has the closest direct contact with the patient and is in a position to obtain assessment data about past medical conditions and other medications the patient may have been taking. Having a good knowledge base about contraindications for specific drugs will help guide the nurse in analyzing the assessment data and making sound judgments required in providing safe nursing care.

The practical nurse must be aware that contraindications may make the use of a medication on a particular patient impossible or ill-advised. One of the most common contraindications is the presence of another medication in the body. This presence of more than one medication in the body may have one of the following effects:

- The drugs may be synergistic, working together to produce an effect which neither would produce alone.
- The interacting drugs may potentiate, increasing or prolonging the effects of one or both drugs.
- The drugs may have antagonistic effects, causing the two drugs to counteract each other.

Both desirable and undesirable interactions of each type mentioned above exist. For example, some medications are actually a combination of two or more drugs, which interact to produce a desired effect.

It is the practical nurse's responsibility to be able to check for interactions. Most medication references only give information for a single medication, but charts are available that show the more common interactions between medications. If these charts do not provide sufficient information, you should discuss the medication with the pharmacist. If you have any doubts, discuss the situation with your charge nurse.

Refer to chart after page 34 and Supplement 4.

OBJECTIVE 8 **Identify common drugs within each classification of medication.**

Acquiring general information about the broad classifications of drugs provides a valid knowledge base for clinical practice. As new drugs are ordered the nurse can determine the proper classification and implement care immediately and safely based on general information about the medications.

Refer to chart after page 34.

OBJECTIVE 9

Identify the nursing implications for common classifications of medications.

The practical nurse needs a sound knowledge base about drugs to effectively apply the nursing process in the clinical setting.

- **Assessment**—Each classification of drugs has specific on-going assessments required to determine adverse or toxic effects.
- **Analysis**—The knowledge base about general classifications of drugs provides the theoretical basis to make judgments, identify problems, and provide safe nursing care.
- **Planning**—The practical nurse will be involved in planning care for patients, and this plan always includes all dependent interventions (administering medications is a dependent function). The nurse will need to incorporate any teaching specific to the drugs the patient is taking and provide safe nursing care.
- **Implementation**—A major nursing role for the practical nurse is to identify specific routes, dosage rates and the specific techniques required for safe administration of drugs.
- **Evaluation**—Knowledge of the therapeutic purpose and actions of broad classifications of drugs provides the basis for evaluation of nursing care and the treatment plan.

Refer to chart after page 34.

- **Evaluation**—Knowledge of the therapeutic purpose and actions of broad classifications of drugs provides the basis for evaluation of nursing care and the treatment plan.

Refer to chart after page 34.

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
Adrenal corticosteroids	anti-inflammatory	reduce organ transplant rejection, arthritis, allergies, Addison's disease, cerebral edema, collagen disorders, hematologic disorders	adrenocortical insufficiency, susceptibility to infection, osteoporosis, fluid and electrolyte imbalance	long-term use, infections, hypothyroidism, hypertension, CHF psychosis, diabetes, children, pregnancy	do not stop abruptly, oral doses with meals, watch for infections, only as ordered	dexamethasone, hydrocortisone, methylprednisolone, prednisone
Adrenergics	mimic the sympathetic nervous system	cardiac arrest, increase B/P, in shock constrict capillaries, dilate bronchioles and pupils	arrhythmias, raises B/P, tremors, H/A, angina, tissues necrosis	angina, hypertension, glaucoma, arrhythmias, organic brain damage	monitor vital signs	epinephrine, dopamine, isoproterenol, norepinephrine
Analgesics	relief of pain					
SUBCLASS **a. Narcotic analgesics**	alters perception of pain	severe or chronic pain	sedation, confusion, H/A, agitation, lowers B/P and respiratory depression, dependence, N/V	head injury, CNS depression, hepatic and renal disease, addiction prone	monitor respiration, if less than 12 do not give	meperidine, codeine, morphine, hydromorphine
b. Non-narcotic analgesics **i. Salicylates**	associated with inhibition of prostaglandin	pain, inflammation, fever	prolonged bleeding time, ulceration, tinnitus	GI ulcer or bleeding, anticoagulants, Hodgkin's disease, asthma, children with viral infections	give with food; keep out of reach of children	acetylsalicyclic acid (aspirin)
ii. Acetaminophen	similar to salicylates	moderate pain, fever	liver toxicity, rash, urticaria	alcoholism		acetaminophen
iii. Ibuprofen	similar to salicylates	moderate pain, fever	prolonged bleeding time	heart, kidney, or liver disorders, children with viral infections, GI ulcer	give with food	ibuprofen
Androgens	stimulate development of male characteristics	replacement therapy in hypogonadism, endometriosis, fibrocystic breast disease, post-partum breast engorgement	edema, acne, oligospermia, change in libido, gynecomastia in male, female develop male characteristics, jaundice, N/V	heart, kidney, or liver disorders, geriatric males, prepubertal males	discuss effects	testosterone, methyltestosterone
Anesthetics	produces loss of sensation, muscle relaxation, loss of consciousness	local and general anesthesia	vary with drug		give only with special training	lidocaine, procaine, HC1, nitrous oxide, halothane

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
Antacids	neutralize gastric hydrochloric acid	relief of indigestion; relieve pain and promote healing of ulcers	constipation, diarrhea, electrolyte imbalance, calculi, intestinal gas	CHF, renal disease, cirrhosis, dehydration	discuss OTC use and compatibility with other medications	aluminum calcium carbonate (combinations)
Antianxiety agents (minor tranquilizers)	reduce anxiety and promote relaxation without sedation	short-term treatment of anxiety disorders, neurosis, psychosomatic disorders, insomnia	depression, H/A lethargy, confusion, tremor, rash, photosensitivity	depression, suicidal tendencies, depressed VS, liver and kidney dysfunction, pregnancy, elderly	caution about operating machinery	alprazolam chlordiazepoxide diazepam hydroxyzine, meprobamate
Antiarrhythmics	act to suppress cardiac arrhythmias (differs by drug)	cardiac arrhythmias	lowers B/P, slow heartbeat, tachycardia cardiac arrhythmias		monitor VS	lidocaine, procainamide, quinidine
Anticoagulants	prevent clots or decreases extension of existing clots					
SUBCLASS **a. Coumarin**	interferes with the action of Vitamin K	long-term anticoagulant therapy	minor bleeding to severe hemorrhage	GI disorders, kidney and liver dysfunction, blood dyscrasias, preoperative	oral form only; monitor PT; antidote: Vitamin K	coumadin
b. Heparin	acts on thrombin; inhibits the action of fibrin in clot formation	venous thrombosis; pulmonary embolism; coronary occlusion	minor bleeding to severe hemorrhage	GI disorders, kidney and liver dysfunction, blood dyscrasias, preoperative	IV or subcutaneous use, antidote; protamine sulfate; monitor PTT	heparin
Anticonvulsants	reduce number and/or severity of seizures	epilepsy, lesions to temporal lobe of the brain	sedation, nystagmus, GI distress, rash, anemia	kidney or liver disease, CHF, hypotension	avoid oversedation	phenytoin, primidone, phenobarbital
Antidepressants (mood elevators)	various types of depression					
SUBCLASS **a. Tricyclics**	delayed action, elevate mood, increase alertness		anticholinergic effects	cardiac, renal or liver disorders, elderly, glaucoma	given at bedtime	amitriptyline, doxepin, imipramine
b. MAO Inhibitors	blocks monoamine oxidase	used if tricyclics not effective	adrenergic effects	cardiac and liver disease	watch for drug and food interactions, especially foods with tyramine such as cheese, chocolate, caffeine	isocarboxozid phenelzine sulfate
Antidiarrhea agents	vary with medications	increased number of loose stools	transient constipation	infants and elderly if not under medical supervision	adequate fluid intake, bland diet	kaoline and pectin, diphenoxylate catropine

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
Antiemetics	vary with medication	prevent or treat nausea, vomiting, motion sickness	sedation, vertigo, dry mouth, extrapyramidal reactions	small children, pregnancy, debilitation, glaucoma, prostatic hypertrophy	assess for cause of nausea	prochlorperazine, promethazine, dimenhydrinate
Antiflatulents	break up gas bubbles in GI tract	gastric bloating	rare	colic	discuss gas forming foods	simethicone
Antihelmintics	evacuates worm infestation	helminth infestation	varies with drug		recheck for parasite	piperzine, mebendazole, pyrvinium pamoate
Antihistamines	antagonize histamine receptor sites, combat increased capillary permeability, edema inflammation, and itch	symptomatic relief of allergic symptoms, common cold	drying of secretions, sedation, weakness, constipation, insomnia	COPD, asthma, heart disorders, elderly CV disorders, CNS depressants, hypertension	discuss rebound effect, caution if using machinery	dephenhydramine, chlorpheniramine, promethazine
Antihypertensives (hypotensives)	varies with drug	hypertension				
SUBCLASS a. **Rauwolfia Alkaloids**	inhibits sympathetic nervous system		slow action, sedation, sexual dysfunction, GI dysfunction	ulcers or colitis, depression, renal dysfunction, epilepsy	check heart rate, keep in airtight, light-resistant container	reserpine
b. **Beta-adrenergic and calcium blockers**	(See separate listing) block action of sympathetic nervous system	hypertension, bronchoconstriction		chosen on individual basis	monitor heart rate and blood pressure	propranolol, atenolol, labetalol
Anti-infective agents (antibiotics)	fights infection	specific infection	allergic hypersensitivity; direct toxicity, superinfection	known allergy or allergy to similar drug	culture prior to drug administration, adequate fluid intake	
SUBCLASS a. **Aminoglycosides**	gram-negative and gram positive bacteria (antibiotic)	short-term serious infections	kidney damage, ear disturbances, respiratory paralysis, CNS symptoms	tinnitus, hearing loss, kidney dysfunction, dehydration	I & O, report side effects	gentamycin, neomycin, tobramycin
b. **Cephalosporins**	broad spectrum antibiotic	serious infections of respiratory tract, urinary tract, bones, joints, endocarditis, septicemia, PID, meningitis	liver dysfunction, GI distress, local irritation, blood dyscracias	allergy (to penicillin also), prolonged use	add cultured dairy products to diet	cephalexin, cefotaxime, cephamandole

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
c. Chloramphenicol	toxic antibiotic	serious infections where less toxic drugs ineffective, typhoid fever, meningitis, rickettsial infections, bacteremia	bone marrow depression, aplastic anemia, circulatory collapse, neuritis		warnings to patient of severe side effects	chloramphenicol
d. Erythromycins	antibiotic	infections of skin, respiratory tract, STD	GI distress, urticaria, rash, superinfections	liver dysfunction, alcoholism	give with full glass of water	erythromycin
e. Penicillins	antibiotic effective against streptococcal and some staphylococcal and meningococcal infections	gonorrhea, syphilis, rheumatic fever, respiratory and intestinal infections	rash, anaphylaxis, GI distress, fever, blood dyscracias	history of allergy	give on empty stomach with full glass of water	amoxicillin, penicillin G procaine, carbenicillin
f. Tetracyclines	broad-spectrum antibiotics	bacterial infections, atypical pneumonias, STD, acne	GI distress, superinfections, photosensitivity, discolored teeth in young children	children under 8, exposure to sunlight, pregnancy	avoid dairy food, iron and antacids within 3 hours	tetracycline, doxycycline, oxytetracycline
g. Antifungals	varies with medication	susceptible fungi	varies with drug		expose affected area if possible	amphotericin B, griseofulvin, nystatin
h. Antituberculosis	prevent or cure tuberculosis	tuberculosis	GI distress, liver toxicity, fatigue	liver disease, kidney disease	discuss importance of remaining on treatment	isoniazid, ethambutol, rifampin
i. Antiviral	relieve symptoms of viral infection	herpes simplex, herpes zoster	renal dysfunction, lethargy, rash, GI distress, blood dyscracias	kidney or liver disease, dehydration, neurologic abnormalities	apply with finger cot or glove, keep out of eyes	acyclovir
j. Sulfonamides	antibiotic	nonobstructive urinary tract infections	rash, GI distress, fever, jaundice	liver and kidney disease, blood dyscracias, allergy	stress large amounts of fluid	sulfasalazine, sulfasoxazole, co-trimoxazole
k. Urinary anti-infectives	bacteriostatic	urinary tract infections	N/V, weak lower extremities, brown urine, anemia, respiratory distress	asthma, anemia, diabetes, kidney impairment, electrolyte imbalance	give with food or milk	nitrofurantoin
Anti-inflammatory agents	decrease inflammation	musculoskeletal inflammation				
SUBCLASS **a. Non-steroidal anti-inflammatory drug**	inhibit synthesis of prostaglandin	rheumatic disorders, sprains, menstrual cramps	GI ulcers and bleeding, constipation, tinnitus, H/A, hematuria, nervousness, rash	heart, liver, or kidney disorders, ulcers, blood dyscracias, children with viral infections	give with food; watch for bleeding	ibuprofen, indomethacin, naproxin, phenylbutazone
b. Steroids	(See separate listing)					

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
Antineoplastic agents	counteract malignant cells	cancer	immunosuppression, GI distress, hair loss	pregnancy	provide comfort measures by client need	fluorouracil, methotrexate, vincristine, doxorubicin, prednisone
Antiparkinsonian drugs	relieve symptoms of Parkinson's disease	Parkinson's disease	varies with drug		give with food, maintain dosage	levodopa, bromocriptine, trihexyphenidyl
Antipruritics	relieve itching	dermatitis from hives, allergic reactions, poison ivy, and insect bites	skin irritation, stinging, allergies	prolonged use, allergy (-caines)	avoid mucous membranes	benzocaine, calamine, corticosteroid
Antipsychotics	relieve anxiety, modify disturbed behavior	psychoses, neuroses, nausea, and vomiting	postural hypotension, dry mouth, extrapyramidal symptoms	severe depression	be aware of habituation and addiction	chlorpromazine, haloperidol, thioridazine, stelazine
Antipyretics	reduce fever	febrile conditions	same as non-narcotic analugesics	GI bleeding	assess for source of fever	acetaminophen, aspirin
Antiseptics	inhibit growth of bacteria	surgical scrubs, skin cleansers	dermatitis, redness, varies with drug	allergy	rinse thoroughly	hexachlorophene, iodine
Antithyroid	relieves symptoms of hyperthyroidism	preparation for surgical or radioactive iodine therapy	rash, urticaria, blood dyscracias	prolonged therapy over 40 years old	have client notify of illness	methimazole, propylthiouracil
Antitussive	prevent coughing	nonproductive cough, pleurisy, fractured ribs	respiratory depression, constipation, sedation, N/V, GU retention	asthma, COPD	avoid other CNS depressants, increase fluid intake	codeine, hydrocodone, dextromethorphan, dephenhydramine
Antiulcer agents	reduce gastric acid secretion	duodenal and gastric ulcers, GI hypersecretion, esophagitis, upper GI bleeding	diarrhea, dizziness, confusion	kidney or liver disorders	discuss causes of stress	ranitidine, cimetidine
Beta-adrenergic blockers	block the sympathetic nervous system	hypertension, arrhythmias, angina, migraines	hypotension, bronchoconstriction	chosen on assessment of cardiac function	monitor heart rate and blood pressure	propranolol, atenolol, labetalol
Calcium channel blockers	suppress action of calcium on myocardium, decrease cardiac excitability, dilate coronary arteries	arrhythmias, angina, hypertension	hypotension, bradycardia, constipation	heart block or failure, liver or kidney impairment	monitor VS	verapamil
Cardiac glycosides (cardiotonics)	increase force of myocardial contraction	congestive heart failure	N/V, diarrhea, fatigue, restlessness, bradycardia, tremors	pulmonary disease, hypothyroidism, acute MI, myocarditis, glomerulonephritis	teach side effects, avoid OTC drugs, take apical pulse—if less than 60, do not give	digoxin, digitoxin

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
CNS stimulants	promote CNS functioning	overdose, alcoholic stupor, neonatal apnea	nervousness, tachycardia, changes in B/P, dizziness, GI distress	anxiety, drug dependence, heart or kidney disorders, diabetes, glaucoma, hyperthyroidism	watch for tolerance	caffeine, sodium benzoate, amphetamines, methylphenidate
Cholinergics	mimic the parasympathetic nervous system	abdominal retention, myasthenia gravis, open-angle glaucoma insecticide, nonobstructive urinary retention	GI distress, sweating, salivating, bronchial constriction, tachycardia	GI or GU obstruction, hyperthyroidism, peptic ulcer, heart disease, asthma	report side effects, give drug alone	bethanecol, neostigmine, pilocarpine
Cholinergic blockers (anticholinergics)	block the parasympathetic nervous system	GI or GU hypermotility, pre-op, drug induced parkinsonism, spastic disorders, urinary bladder spasm	dry mouth, constipation, fever, confusion, H/A, tachycardia	chronic pulmonary disease, glaucoma, GI or GU obstruction, arrhythmias, B/P	advise client of side effects	atropine, glycopyrrolate, methanelamine
Diuretics	increase urine output	excess fluid				
SUBCLASS **a. Thiazide**	increase water, sodium, chloride, and potassium excretion	edema, hypertension, prophylaxis of stone formation	hypokalemia, hypotension, fatigue, GI distress, H/A	diabetes, gout, liver or kidney disease, prolonged use	give potassium foods, I&O	chlorothiazide, hydrochlorothiazide
b. Nonthiazide	rapid excretion of water, sodium, chloride, and potassium	CHF, pulmonary edema, ascites, hypertension	dehydration, hypokalemia, hypotension, GI effects, hyperglycemia, tinnitus	liver or kidney disease, dehydration, diabetes, gout, digitalized patients	I&O, give potassium foods, monitor weight	furosemide, ethacrynic acid
c. Potassium Sparing	increase sodium and water excretion	high aldosterone levels	hyperkalemia, dehydration, GI distress, hypotension, fatigue	renal insufficiency, cirrhosis, and liver disease	withhold potassium foods, I&O, monitor weight	spironolactone, triamterene
d. Osmotic	combines with water to increase excretion	elevated intracranial pressure	fluid and electrolyte imbalance, CNS symptoms, tachycardia, B/P changes, allergy	kidney, heart, or liver disease	close medical supervision required	mannitol, urea
Emetics	induce vomiting	some poisonings	dehydration, increases B/P	heart disease; ingestion of corrosive, petroleum, or convulsant substance; semiconscious	follow directions on drug, determine source of poison	ipecac syrup
Emollients and Demulcents	protect or soothe minor skin conditions	diaper rash, abrasions, minor burns	rare	history of allergy	apply by instructions	vitamin A&D ointment

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
Estrogens	female hormone, inhibit lactation, inhibit ovulation, develop secondary sex characteristics	contraception, menopause, hypogonadism, nonnursing mothers	thromboembolic disorders, GI effects, increases B/P, edema, migraine, irregular menstruation, liver disease	MI, stroke, embolus, liver or kidney disease, breast nodules, surgery, hypertension, asthma, seizures	instruct client to follow directions	chlorotrianisene, diethylstilbesterol, conjugated estrogens
Expectorants	increase pulmonary secretion, reduce viscosity, and help expel sputum	coughs associated with URI, bronchitis, sinusitis, and COPD	N/V, stomatitis, rhinorrhea, drowsiness	some asthmatics, CV disease, hypertension, diabetes	prevent prolonged self administration	guaifenesin, terpin hydrate
Gout medication	lower uric acid levels	gout				
SUBCLASS **a. Uricosuric agents**	block reabsorption, promote urinary excretion of uric acid	chronic gout or chronic gouty arthritis	H/A, N/V, kidney stones, renal colic	uric kidney stones, peptic ulcer, renal impairment	give large amounts of fluid, give with food	probenecid, sulfinpyrazone
b. Allopurinol	decreases serum and urine levels of uric acid	chronic gout	rash, allergic reactions	liver or kidney disease, allergy	give after meals, increase fluid intake	allopurinol
c. Colchicine	relieve inflammation of gout	acute gout prophylaxis	rash, GI upset, blood disorders		increase fluid intake	colchicine
Insulin	lower blood glucose level	IDDM, type I diabetes	hypoglycemia, irritability, tremors, H/A, convulsion	low blood sugar	provide sugar for symptoms; use precautions when administered	regular, NPH, Lente, ultralente
Keratolytics	control abnormal scaling of the skin or promote peeling of the skin	dandruff, seborrhea, psoriasis, acne, corns, calluses, warts	skin irritation, photosensitivity, allergic, susceptibility to cancer	prolonged use, small children	avoid mucous membranes, use care in application to affected area only	coal tar, salicylic acid, sulfur
Narcotic Antagonists	works to counteract effects of narcotics	narcotic overdoses, delivery and nursery post-op	tremors, N/V, reversal of analgesia	non-opiod respiratory depression	keep resuscitation equipment on hand	naloxone, nalorphine
Laxatives	promote evacuation of the intestine	constipation	diarrhea, electrolyte imbalance, cramping	prolonged use, undiagnosed abdominal pain	teach natural methods of constipation treatment	psyllium, docusate, milk of magnesia, senna
Ophthalmic Drugs	varies with drug	eye disorders				
SUBCLASS **a. Antiglaucoma agent**	reduce intraocular pressure	glaucoma	differs with drug and type of glaucoma		administer by package directions	acetylzolamide, pilocarpine, timolol

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
b. Mydriatics	dilate the pupil	eye examination	increases intraocular pressure, fever, dry skin	angle-closure glaucoma, infants	apply aseptically	atropine, epinephrine
Oral Hypoglycemics	stimulate secretion of insulin by the pancreas	NIDDM (type II diabetes)	GI distress, skin disorders, blood dyscracias, hypoglycemia	debilitation, IDDM, major physical stress, liver or kidney dysfunction	instruct on diet, importance of regular dosage	chlorpropamide, tolazamide, tolbutamide, glyburide
Pediculicides and Scabicides	kills mites and lice infestations	pediculosis, scabes	local irritation, dermatitis	raw, inflamed skin	topical use only	lindane, benzyl benzoate
Progestines	hormone acting on uterus and mammary glands	amenorrhea, uterine bleeding, contraception (with estrogen), metastatic endometrial or renal cancer	menstrual irregularity, H/A edema, depression, rash, breast tenderness, nausea	conditions with danger if fluid retained, history of embolus, pregnancy, nursing mothers	teach self breast exam; dosage at same time every day	progesterone
Sedatives and Hypnotics	promote sedation or sleep	pre-op, seizures, insomnia, anxiety				
SUBCLASS **a. Barbiturates**	CNS depression	anxiety	"hangover," N/V, rash, confusion, respiratory depression	prolonged use, addiction-prone, depression	observe respiration and for dependence	pentobarbital, phenobarbital, secobarbital
b. Non-barbiturate	CNS depression	anxiety, promote euphoria	N/V, rash, confusion, ataxia, dizziness	prolonged use, dependence, debilitation, elderly	prevent falls, watch for tolerance	flurazepam, ethclorvynol, chloral hydrate
Serums	provide passive immunity from antibodies produced by another organism	immediate immunity, inability to produce antibodies	serum sickness (especially equine serum)		watch for allergic reaction and serum sickness	gamma globulin, Hepatitis B, immune globulin
Skeletal Muscle Relaxants	act on spinal cord, brain, and peripheral areas to reduce spasm and rest affected part	acute, painful musculoskeletal conditions, neck strain or backache	drowsiness, weakness, H/A, confusion, lowers B/P, GI distress, respiratory depression	muscular dystrophy, myasthenia gravis, under 12 years old	instruct on doctor's orders for physical therapy	diazepam, methocarbamol, carisoprodol, cylobenzaprin
Somatotropin	promote linear growth	growth failure	pain at injection site, hypercalciuria	brain tumor, no response in one year, diabetes	report urinary symptoms	somatotropin
Thyroid agents	replacement of thyroid hormone	diminished or absent thyroid function, myxedema cretinism	arrhythmias, fever, weight loss, menstrual irregularities, diarrhea	cardiovascular disease, elderly, adrenal insufficiency, diabetes euthyroid	report symptoms	levothyroxin, thyroid
Vaccines	antigen which causes the body to produce antibodies to a specific disease	active immunity against common infectious diseases	varies with vaccine	history of allergy	instruct to keep record	DPT, MMR, influenza vaccine, TOPV

CLASSIFICATION	ACTION	INDICATIONS	SIDE EFFECTS	CONTRAINDICATIONS	NURSING ACTIONS	EXAMPLES
Vasodilators	dilate blood vessel					
SUBCLASS **a. coronary**	dilate coronary arteries	angina	H/A, postural hypotension, dry mouth, flushing	glaucoma, increased intracranial pressure, anemia	assist to rise slowly, monitor B/P	nitroglycerin, isosorbide
b. peripheral	dilate peripheral vessels	arteriosclerosis, gangrene, scleroderma, Buerger's disease, Raynaud's disease, frostbite, thrombophlebitis	increased secretions, H/A, dizziness, blood dyscracias, arrhythmias	gastritis, peptic ulcer, coronary artery disease, CVA	teach side effects	tolazoline
Vitamins and minerals	varies with vitamin or mineral, supplement to diet	inadequate diet, malabsorption syndrome, increased need for specific nutrient deficiency due to medication interaction	varies with vitamin	hypervitaminosis	teach adequate diet intake if appropriate	vitamins A, D, B, E, K, C, potassium, iron, calcium

OBJECTIVE 10

Identify patient assessment data that influence selection and administration of medications.

Before a doctor chooses a medication for a patient, several factors must be considered. The nurse should be familiar with the factors in order to safely administer medications and provide effective on-going assessment of the patient.

- Effects of the medication—The effects of the medication must always be considered foremost.
- Side effects
- Contraindications
- Route of availability of the medication
- Dependability of medication's absorption into the system
- Method of distribution of the medication
- Rate of metabolism of the medication
- Method of excretion of the medication

Selection and administration of medication are influenced by patient assessment data:

- **Age**—The age of the patient has a definite impact on dosage amounts. Children and elderly people generally need lower dosages.
- **Body size**—Determines the dosage amount of most medications. Usually larger patients require more medication.
- **Sex**—The sex of the patient may influence the choice because of hormonal differences and the ratio of fat per body mass.
- **Physiologic state**—The patient's physical ability to absorb, distribute, metabolize and excrete a medication.
- **Patient's belief in the effectiveness of the medication**—This belief may affect the patient's response to the medication.

All of these and any individual considerations must be made prior to giving a medication.

SOURCES OF DRUGS

Drugs are derived from four basic sources; plants, minerals, animals, and synthetic. The following chart gives some examples of this.

SOURCES OF DRUGS:

	EXAMPLE	TRADE NAME	CLASSIFICATION
PLANTS	cinchona bark	Quinidine	antiarrhythymic
	purple foxglove plant	Digitalis	cardiotonic
	poppy plant (opium)	Paregoric Morphine Codeine	antidiarrheal analgesic analgesic, antitussive
MINERALS	magnesium	Milk of Magnesia	antacid, laxative
	silver	Silver Nitrate	ophthalmic anti-infective (eye drops placed in the eyes of newborns)
	gold	Solganal, Auranofin	anti-inflammatory; in the treatment of rheumatoid arthritis
ANIMALS	pancreas of cow, hog	Insulin	antidiabetic hormone
	stomach of cow, hog	Pepsin	digestive hormone
	thyroid gland of animals	Thyroid, USP	Hormone
SYNTHETIC	meperidine	Demerol	analgesic
	diphenoxylate	Lomotil	antidiarrheal
	sulfisoxazole	Gantrisin	anti-infective sulfonamide; used in the treatment of urinary tract infections

Reproduced by permission. *Essentials of Pharmacology for Health Occupations* by Ruth Woodrow. Delmar Publishers Inc., Copyright 1987.

HISTORY OF DIGITALIS AND PENICILLIN

Although the history of a drug is not necessary before giving a drug, knowledge of history lends understanding to how drugs are discovered and the significance of continued research. The following two drug histories represent an old drug and a fairly new drug that are considered vital to medicine today.

The discovery of digitalis was made by Dr. William Withering. A woman in Shropshire, England had gained recognition for relieving "dropsy" which is an old term for the edema of heart disease. The woman used a combination of 20 herbs one of which was from the fox-glove plant which is also known as Digitalis purpurea. Dr. Withering bought the formula from the woman and in about 1775 began to study the effects of digitalis. He recognized the loss of water and thought the effect was on the kidneys. We now know that the effect is almost exclusively on the heart, but his efforts have provided help for many people.

Even with all the advances in the twentieth century, the story of the discovery and development of antibiotics may be the greatest medical breakthrough. In 1928, Sir Alexander Fleming noticed the lack of bacterial growth on culture plates that were growing Penicillium notatum. The substance was found to have antibacterial action when prepared with a nutrient broth. Research proved the penicillin effective both in the test tube and in the body. It remained in the research phase until Drs. Chain and Florey at Oxford brought the discovery to prominence in 1940. Penicillin lead the way for other anti-bacterials which have removed the threat of many of the infections which previously were major causes of death.

Used with permission. PHARMACOLOGY AND THERAPEUTICS by Ruth D. Musser and John J. O'Neill. MacMillian Publishing Company, Copyright 1969.

EMERGENCY SUPPLIES FOR ALLERGIC REACTIONS

Allergic reaction may occur when administering any medication. The reaction may range from mild rashes to anaphylaxis. Anaphylaxis is a life threatening response of the body which can quickly lead to death. Immediate care must be given by the medical team.

The following supplies and medications are recommended to be available when giving medications to clients.

- Epinephrine
- Aminophylline
- Dephenhydramine
- Vasopressor (commonly dopamine)
- Steroids
- IV infusions materials
  - tourniquet
  - syringes
  - needles
  - alcohol swabs
  - IV solutions
- Blood pressure monitoring equipment
- Oral airways
- Oxygen
- Cardiac support system

Reproduced by permission. MEDICATIONS & MATHEMATICS FOR THE NURSE 6/E by Jane Rice and Esther Skelley. Delmar Publishers Inc., Copyright 1988.

DRUG INCOMPATIBILITY

Drugs may interact with each other in many ways. This interaction may be beneficial or harmful. When drugs are considered to be harmful when mixed together or given together, they are said to be incompatible. The following chart gives some of the more common incompatibilities.

Possible Pharmacological Drug Interactions

	aminophylline	ampicillin	atropine	calcium	Coumadin	Demerol	digoxin and other cardiac glycosides	Dilantin	glucagon	Heparin	Inderal	Isuprel	Lasix	Levophed	morphine	nitroglycerin	potassium	Pronestyl	Prostaphlin	quinidine	Tensilon	Valium	Xylocaine
aminophylline					X																		
ampicillin					X																		
atropine						X						X		X	X	X		X		X	X		
calcium							X																
Coumadin	X	X				X	X	X	X	X			X		X				X	X		X	
Demerol			X		X											X					X	X	
digoxin and other cardiac glycosides				X	X			X		X	X	X	X				X	X		X			
Dilantin					X		X				X		X							X		X	
glucagon					X																		
Heparin					X		X												X				
Inderal							X	X				X	X	X	X	X		X		X			
Isuprel			X				X				X					X							
Lasix					X		X	X			X			X								X	
Levophed			X								X		X			X							
morphine			X		X						X										X	X	
nitroglycerin			X			X					X	X		X									
potassium							X																
Pronestyl			X				X				X									X	X		X
Prostaphlin					X					X													
quinidine			X		X		X	X			X							X			X		X
Tensilon			X			X									X			X		X			
Valium					X	X		X					X		X								
Xylocaine																		X		X			

"X" indicates an interaction between two drugs given concurrently or within the span of action of either.

Used with permission of American Journal of Nursing.

AGENCIES AND LAWS RELATING TO PHARMACOLOGY

In the United States there are two major federal organizations which are responsible for aspects of pharmacology. The Food and Drug Administration is responsible for maintaining the safety of drugs, food, and cosmetics. It does this by regular inspections of plants which make or handle the three products as well as assure proper labeling of those products. The FDA reviews and investigates both old and new drugs and allows only those which are found to be safe to be marketed.

The Drug Enforcement Administration manages aspects of controlled substances and enforces laws concerning illegal drug use, dealing and manufacturing. The law which it enforces in medical use of drugs is the Controlled Substances Act of 1970 which provides for limitations in manufacturing, importing, compounding, selling, dealing, and giving away controlled substances. Guidelines for prescriptions and methods of recording use is delineated by this law.

The first law which concerned pharmacology was the Pure Food and Drug Act of 1906. This was the first law that provided protection for the consumer of these products. It required manufacturers to meet minimum standards for strength, purity and quality of drugs. Morphine containing products must be labeled as such. The two official references, the United States Pharmacopoeia (USP) and the National Formulary (NF) which have now become one, were also established by this law.

Every health care worker must be aware of the laws which influence action. Whether one of the above, the Nurse Practice Act in the state, or other laws which apply to drug administration, they must be followed. Failure to do some may bring loss of license or may result in legal action being taken.

Reproduced by permission. ESSENTIALS OF PHARMACOLOGY FOR HEALTH OCCUPATIONS by Ruth Woodrow. Delmar Publishers, Inc., 1987.

IDENTIFY CLASSIFICATIONS OF CONTROLLED DRUGS

The FDA has set up the classifications for controlled drugs. The following chart gives the classifications, abuse potential and legal limitations, and examples of each class.

Schedule Number	Abuse Potential and Legal Limitations	Examples of Substances
1. CI	High abuse potential Limited medical use	heroin, LSD, marijuana, mescaline
2. CII	High abuse potential May lead to severe dependence Written prescription only No phoning in of prescription by office health worker No refills In emergency, physician may phone in, but handwritten prescription must go to pharmacy within 72 hours	morphine, codeine, Demerol, methadone, Percodan, Dilaudid, Ritalin, cocaine
3. CIII	May lead to limited dependence Written or verbal (phoned in) prescription, by physician only May be refilled up to five times in 6 months	paregoric, Noludar, Empirin with codeine, aspirin with codeine, Fiorinal
4. CIV	Lower abuse potential than the above schedules Prescription may be written out by health care worker, but must be signed by physician Prescription may be phoned in by health care worker May be refilled up to five times in 6 months	Valium, Placidyl, chloral hydrate, phenobarbital, Librium, Darvon, Dalmane
5. CV	Low abuse potential compared to the above schedules Depending on state law, may require a prescription or may be sold over the counter; purchaser must be 18 years old and sign a form (Exempt Narcotic Registration Form) with the pharmacist Consists primarily of preparations for cough suppressants containing codeine and preparations for diarrhea (e.g., paregoric, an opium tincture)	Cheracol syrup, Robitussin-DAC, Dimetane Expectorant DC, Donnagel-PC, Lomotil

Reproduced by permission. ESSENTIALS OF PHARMACOLOGY FOR HEALTH OCCUPATIONS by Ruth Woodrow. Delmar Publishers, Inc., 1987.

ASSIGNMENT SHEET 1

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

OBJECTIVE 11

Identify trade and generic names of medications.

NAME ______________________________ SCORE _______

INTRODUCTION

A medication may have several different names. The four general types of names that exist for medications include

- **Generic**—The generic name is not capitalized and is most commonly used by health care professionals regardless of the manufacturer of the drug.
- **Trade**—The trade name is the registered name that the manufacturing company assigns to their medication product. This name is capitalized and frequently includes the registered trademark sign, R.
- **Chemical**—The chemical name, which gives the exact molecular formula of the drug, is rarely used by health care workers.
- **Official**—The official name, which is usually the same as the generic name, is used to list the drug in the United States Pharmacopoeia/National Formulary.

EXAMPLE: The practical nurse should know the generic names and the corresponding trade names of drugs commonly used in their local facility.

This sheet is to help you become more familiar with both names for some of the more common drugs. If the generic name is listed write a trade name and if the trade name is listed give the generic name.

a. Aspirin ______________________________

b. Lidocaine ______________________________

c. Heparin ______________________________

d. Nembutal ______________________________

e. Phenytoin ______________________________

f. Keflex ______________________________

g. Furadantin ______________________

h. Zantac ______________________

i. Aminophylline ______________________

j. Dephenhydramine HCl ______________________

k. Tolbutamide ______________________

l. Catapres ______________________

m. Naloxone ______________________

n. Kwell ______________________

o. Flurazepam ______________________

p. Levothyroxin ______________________

q. Isordil ______________________

r. Potassium chloride ______________________

s. Vistaril ______________________

ASSIGNMENT SHEET 2

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

III

OBJECTIVE 12

Use references to obtain information about drugs.

NAME ______________________________ SCORE ________

Any health professional who administers medication must know how to find information on the drugs he/she administers. There are many resources available. Regardless of which reference is used, the key to finding the drug is locating the listing for the drug. This assignment sheet lists names of drugs and you are to list the trade name of the drug and the page on which it can be found in the reference being used.

Reference(s) being used (if second source used place a -2 by the page number.)

1. ____

2. ________ ______________________________

Drug (generic name)	Trade Name(s)	Page Location
a. Prednisone	______________	__________
b. Dopamine	______________	__________
c. Acetaminophen	______________	__________
d. Meperidine	______________	__________
e. Diazepam	______________	__________
f. Warfarin	______________	__________
g. Simethicone	______________	__________
h. Reserpine	______________	__________
i. Gentamycin	______________	__________
j. Naproxin	______________	__________
k. Haloperinol	______________	__________
l. Cimetidine	______________	__________
m. Digoxin	______________	__________

n. Verapamil ______________ ______________

o. Theophylline ______________ ______________

p. Hydrochlorothiazide ______________ ______________

q. Furosemide ______________ ______________

r. Glyburide ______________ ______________

OBJECTIVE 13 **Develop patient instruction on medication.**

NAME ________________________________ SCORE _______

One of the challenges of giving medications is to teach the patient to take the medication at home. Using information found in references, write the instructions you would give the following patients for the medication prescribed.

Mrs. Bell is an 83 year old who has just begun treatment for congestive heart failure with digoxin. She lives alone and has difficulty hearing.

Joe Hanks is 16 and a newly diagnosed diabetic. He is to give himself insulin every morning, what would you tell him about insulin?

Mr. Franz, 46, has epilepsy and has been on Dilantin for 10 years. He has not been maintaining his prescribed dosage and was admitted for frequent seizures. While in the hospital the same dosage as prescribed for home use was effective. What suggestions could be made to make home use more consistent?

ASSIGNMENT SHEET 1

a. acetylsalicylic acid

b. Xilocaine

c. Hepalean, Lipo-Hepin

d. pentobarbital

e. Dilantin

f. cephalexin

g. nitrofurantoin sodium

h. ranitidine hydrochloride

i. somophyllin

j. Benadryl

k. Tolinase

l. clonidine hydrochloride

m. Narcan

n. lindane

o. Dalmane

p. Levothroid, Synthroid

q. isosorbide dinitrate

r. K-Cl, K-Lor, Kaon-Cl, K-Lyte

s. hydroxyzine pamoate

ASSIGNMENT SHEET 2

1. Approved by instructor

2. Approved by instructor

NOTE: major trade names used: others may be available

a. Colisone, Deltasone, Orasone (page numbers will differ)

b. Intropin, Revimine

c. APAP, Tempra, Tylenol, Liquiprin

d. Demerol, Pethidol

e. Valium, Stress-Pam, Meral

f. Coumadin Sodium, Panwarfin

g. Mylicon, Gas-x, Silain

h. Serpasil, SK-Reserpine, Serpate

i. Garamycin, Apogen, Cidomycin

j. Naprosyn

k. Haldol, Peridol

l. Tagamet, Apo-Cimetidine, Peptol

m. Lanoxin, Masoxin, SK-Digoxin

n. Calan, Isoptin

o. Theo-Dur, Quibron-T, Elixophyllin

p. HCTZ, Oretic, Hydro-Diuril, Esidrix

q. Lasix, Furoside, Uritol

r. DiaBeta, Micronaise, Euglucon

ASSIGNMENT SHEET 3

Answers should include all steps in patient teaching.

Include such items as:

- Name of medication
- Schedule/instruction for administration of medication
- Side effects to be reported
- Follow-up visits to doctor's office
- Have patient repeat instructions and demonstrate procedures.

WRITTEN TEST

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

III

NAME ______________________________ SCORE _______

OBJECTIVE 1

Match the terms used in the description of medications to their correct definitions. Write the letters of the correct answers in the blanks provided.

___ 1. Severe response to drugs

___ 2. The study of drugs

___ 3. Dangerous effects of a drug caused by too much of the drug within the system

___ 4. The study of how drugs interact with body tissues

___ 5. Chronic misuse of a drug

___ 6. Reasons for a certain drug being used

___ 7. Drug used for medical therapy

___ 8. Effects of a drug (or other agent) on the embryo or fetus caused when the drug crosses the placenta

___ 9. Effects of drugs which prevent, diagnose, or treat or conditions

___ 10. An inactive substance resembling a medication that produces effects on the body because of the patient's belief in that effect

___ 11. Severe, life-threatening allergic response

___ 12. Condition or reason that makes the use of a drug dangerous or ill-advised

a. Adverse effect

b. Anaphylaxis

c. Contra-indication

d. Drug

e. Drug abuse

f. Drug dependence

g. Drug idiosyncrasy

h. Indications

i. Medication

j. Pharmacology

k. Pharmaco-dynamics

l. Placebo

m. Precaution

n. Side effects

o. Teratogenic effects

p. Therapeutic effects

q. Toxic effects

OBJECTIVE 2

Identify ways that drugs are classified. Identify the common classifications of drugs according to their accessibility by placing the correct terms in the spaces provided.

1. __________—Medication which may be purchased with no prescription
2. __________—Medications that require a prescription because of the possible harmful effects the client may encounter if he takes the drug indiscrimininately.
3. __________—Medication that require a prescription because of the danger of the client abusing the drug or becoming addicted to the drug.
4. __________—Drugs that are illegal to use and must be obtained by illegal means.

a. Illegal
b. Legend
c. Controlled
d. Over-the-counter

OBJECTIVE 3

Identify general purposes for which medications are given to patients. Write the letter of the correct answers in the blanks provided.

____1. Which purpose does administration of analgesics serve?

a. Prevention
b. Treatment
c. Diagnosis
d. Cure

____2. Which purpose does administration of vitamins usually serve?

a. Replacement
b. Treatment
c. Diagnosis
d. Cure

___ 3. **Which purpose does administration of antineoplastics serve?**

a. Prevention

b. Treatment

c. Diagnosis

d. Cure

OBJECTIVE 4

Differentiate between systemic and local effects of medications. Write "G" in the blank before each statement that has a generalized or systemic effect or an "L" in the blank before each statement that has a local effect.

___ 1. lidocaine for anesthesia at suture site

___ 2. ointment for relief of scaling skin

___ 3. analgesic for relief of headache

___ 4. insulin for decrease of blood sugar

OBJECTIVE 5

Identify the therapeutic actions of the most common classes of medications. Write the letters of the correct answers in the blanks provided.

___ 1. Which drug is not a laxative?

a. milk of magnesia

b. ducosate sodium

c. psyllium

d. aluminum hydroxide

___ 2. Which drug is NOT an anti-inflammatory medication?

a. acetaminophen

b. acetylasilcyclic acid

c. ibuprofen

d. hydrocortisone

____3. Which classification is used to lower blood sugar?

a. antithyroid

b. glycoside

c. hypoglycemic

d. diuretics

____4. Which classification is used to prevent vomiting?

a. antiemetic

b. emetic

c. antiflatulent

d. anticonvulsant

____5. Which classification mimics the sympathetic nervous system?

a. anesthetics

b. adrenergics

c. somatortropins

d. cholinergics

____6. Which classification treats parasitic infestations?

a. antihelmintics

b. pediculicides

c. scabicides

d. all of the above

____7. Which of the following classifications is most appropriate for treatment of severe pain?

a. sedative

b. hypnotic

c. narcotic analgesic

d. non-narcotic analgesic

___ 8. **Which classification is the first choice for treatment of depression?**

a. **tricyclics**

b. **antianxiety agents**

c. **MAO inhibitors**

d. **minor tranquilizers**

___ 9. **Which classification is used to reduce organ transplant rejection?**

a. **androgens**

b. **adrenal corticosteroids**

c. NSAID

d. beta-adrenergic blockers

OBJECTIVE 6

Identify the side effects of the common classifications of medications. Write the letters of the correct answers in the blanks provided.

___ 1. A frequent side effect of antibiotics is:

a. superinfection

b. kidney dysfunction

c. GI bleeding

d. hypotension

___ 2. A common side effect of calcium channel blockers and beta-adrenergic blockers is:

a. hypotension

b. tachycardia

c. diarrhea

d. renal calculi

____3. Which classification does NOT usually cause GI distress?

a. NSAID

b. antipsychotics

c. antibiotics

d. analgesics

OBJECTIVE 7

Identify contraindications of the common classifications of medications. Write the letters of the correct answers in the blanks provided.

____1. Which of the following would be an idiosyncratic effect of vasodilator?

a. hypertension

b. dry mouth

c. flushing

d. headache

____2. Which disease is a contraindication for anticoagulant therapy?

a. peptic ulcers

b. hemophilia

c. hemorrhoids

d. all of the above

____3. Which medication is contraindicated for prolonged use?

a. cardiac glycosides

b. insulin

c. anticonvulsants

d. antipruritics

___ 4. Which classification of medications should not be given to patients with COPD?

a. antitussive

b. bronchodilators

c. diuretics

d. adrenergics

___ 5. Which classification of medication should be held if the respirations are less than 12?

a. antihistamines

b. cardiac glycosides

c. narcotic analgesics

d. diuretics

___ 6. Which vital sign is most essential when administering cardiac glycosides?

a. temperature

b. pulse

c. respiration

d. blood pressure

___ 7. Two drugs which counteract each other are considered:

a. antagonists

b. synergistic

c. potentiators

d. counteractants

____8. Two drugs that increase or prolong the effects of one or both drugs are considered

a. Antagonists

b. Synergistic

c. Potentiators

d. Counteractants

____9. Two drugs that work together to produce an effect which neither would produce alone are considered

a. Antagonist

b. Synergistic

c. Potentiators

d. Counteractants

OBJECTIVE 8

Identify common drugs within each classification of medication. Write the letters of the correct answers in the blanks provided.

____1. Which classification includes epinephrine and dopamine?

a. cholinergics

b. anesthetics

c. adrenergics

d. sedatives

____2. Which classification includes nystatin?

a. antibiotic

b. antiviral

c. antifungal

d. antiseptic

OBJECTIVE 9

Identify the nursing implication for common classifications of medications. Write the letters of the correct answers in the blanks provided.

___ 1. Your patient has been given adrenergics, you should:

- a. Watch for infection
- b. Monitor vital signs
- c. Order a bland diet
- d. Give with food

___ 2. Your patient has been given androgens, you should:

- a. give only with special training
- b. monitor vital signs
- c. discuss effects with your patient
- d. caution about operating machinery

___ 3. Your patient has been given an antianxiety agent, you should:

- a. Monitor vital signs
- b. discuss over-the-counter drugs and effects with other medications
- c. Watch for food interactions
- d. Caution about operating machinery

___ 4. Your patient has been given a Beta-adrenergic or calcium blocker, you should:

- a. Monitor heart rate
- b. Add cultural dairy products to diet
- c. Give with full glass of water
- d. Give on a empty stomach with a full glass of water

____5. Your patient has been given an anti-inflammatory agent for a musculoskeletal inflammation, you should:

a. Give with food, maintain dosage

b. Give with food, watch for bleeding

c. Assess for source of fever

d. Monitor vital signs

OBJECTIVE 10

Identify drug factors and patient assessment data which influence selection and administration of medication. Write the letters of the correct answers in the blanks provided.

____1. Which patient factor determines dosage of most medications?

a. age

b. weight

c. sex

d. all of the above

____2. Which group generally requires the smallest dosages of medications if all are normal size for age?

a. middle aged women

b. middle aged men

c. elderly women

d. elderly men

____3. Which aspect of a medication would have to be known and considered first in a patient with kidney failure?

a. route of availability

b. dependability of absorption

c. rate of metabolism

d. method of excretion

NOTICE	The following assignment sheets are not part of the written test, if this activity has not been completed check with your instructor	
OBJECTIVE 11	**Identify trade and generic names of medications.**	SCORE _____
OBJECTIVE 12	**Use references to obtain information about drugs.**	SCORE _____
OBJECTIVE 13	**Develop patient instruction on medication.**	SCORE _____

WRITTEN TEST ANSWERS

IDENTIFY CLASSIFICATION AND EFFECTS OF MEDICATION

III

OBJECTIVE 1	1. a	7. i
	2. j	8. o
	3. q	9. p
	4. k	10. l
	5. e	11. b
	6. h	12. c
OBJECTIVE 2	1. d	
	2. b	
	3. c	
	4. a	
OBJECTIVE 3	1. b	
	2. a	
	3. d	
OBJECTIVE 4	1. L	
	2. L	
	3. G	
	4. G	

OBJECTIVE 5

1. d
2. a
3. c
4. a
5. b
6. d
7. c
8. a
9. b

OBJECTIVE 6

1. a
2. a
3. b

OBJECTIVE 7

1. a
2. d
3. d
4. a
5. c
6. b
7. a
8. c
9. b

OBJECTIVE 8

1. c
2. c

OBJECTIVE 9

1. b
2. c
3. d
4. a
5. b

OBJECTIVE 10

1. d
2. c
3. d

OBJECTIVES 11-13 Refer to answers to Assignment Sheets 1 through 3.

OBJECTIVE SHEET

ADMINISTER MEDICATIONS

IV

INTRODUCTION

This unit focuses on the skills necessary for the practical nurse to administer medications. To administer medications correctly and conscientiously, you must know some basic information about the methods used to give medications and the purpose of each type of administration. Although some administration skills are used many times each day and others are used less frequently, proficiency is necessary for the practical nurse to be competent in this area.

Thorough knowledge of administration of medication is required prior to giving medications. Furthermore, you must continuously update your skills in medication administration as new products and methods enter the market. You must be familiar with how medication is given and the specifics of administering each medication. This knowledge can decrease the risks, which are always present, when administering medication. By following correct procedure and using acceptable techniques, you will be able to administer medications safely and accurately.

UNIT OBJECTIVE

After completing this unit, the student should be able to administer all forms of medications that are the Licensed Practical Nurse's responsibility. The student will show these competencies by completing assignment sheets, job sheets, practical tests, and the written test with a minimum of 85 percent accuracy.

PREREQUISITES

Before studying this unit, the student should have successfully completed units on "Calculate Medication Dosage," "Document Medications," and "Identify Classification and Effects of Medication."

SPECIFIC OBJECTIVES

After completing this unit, the student should be able to

1. Utilize patient assessment data prior to medication administration.

2. Verify the five rights of medication administration prior to administering medication.

3. Verify a medication during preparation.

4. Identify various systems of medication distribution.

5. Identify the various forms of medication.

6. Select appropriate guidelines for administering medications other than injections.

7. Identify the parts of a syringe and needle.

8. Select appropriate guidelines for administering intramuscular, subcutaneous, and intradermal injections.

9. Identify methods used when administering medications to a young child or infant.

10. Identify methods used to read a medicine glass.

11. Communicate appropriately during administration of medication. (Assignment Sheet 1)

12. Read a medicine glass. (Assignment Sheet 2)

13. Demonstrate the ability to

    a. Prepare an injection from a single or a multi-dose vial.

    b. Prepare an injection from an ampule.

    c. Administer sublingual medication.

    d. Administer buccal medication.

    e. Apply topical medication.

    f. Administer eye medication.

    g. Administer ear medication.

    h. Administer nasal medication.

    i. Administer oral medication.

    j. Crush medication for administration.

    k. Administer medication by nasogastric tube.

    l. Administer subcutaneous injection.

    m. Administer subcutaneous insulin.

    n. Administer subcutaneous heparin.

o. Administer intramuscular injection.

p. Administer medication by z-tract method.

q. Administer an intradermal injection.

r. Combine medications for injection.

s. Prepare an injection from dry medication using diluent.

t. Administer rectal suppository.

u. Administer vaginal medication.

PREPARATION

- Order materials to supplement unit
  - Film, videotapes and other media
- Plan for required practicum for administering medications and documentation.
- Invite guest speaker

  NOTE: Please provide the guest speaker with the specific topic relevant to the unit of instruction ahead of time.
- Ask spokesperson from nursing home, hospital, or home health care profession to discuss administering medications.
- Plan for evaluation schedule for students.

DELIVERY

- Introduce the unit by reviewing the nursing process.
  - The nursing process is an organized, systematic approach to all nursing care and should be incorporated into the procedure of administration of medications.
  - Assessment should include complete assessment of the patient prior to administering any medications to determine individual needs and characteristics. Data collection should also include any information pertaining to the specific drug.
  - Analysis should include a thorough review of all available data and any decisions required to individualize the process and meet the needs of the patient and safely administer medications.
  - Planning should reflect the decisions made in the analysis process and should be individualized and specific to each patient in terms of methods and approach to administration of medications.
  - Implementation is the step for following through with the plan and administering medications in a well-organized, individual, safe manner for each patient.

- Evaluation should include the on-going assessment of the patient to determine the effectiveness of the medications, any side affects or adverse reactions, and the need to modify the treatment plan or modify the approach to better meet the needs of the patient.

Objective 1

- Review the nursing process and discuss each step in relation to administration of medication.
- Emphasize that all nursing actions should be based on scientific knowledge base and the nursing process.
- During clinical situations encourage the students to demonstrate each step of the nursing process while administering medications.
- Ask students about any past experience in giving medication to family members or self by any route.
- Discuss how assessment helps the average patient as well as the patient with special needs.
- Have students write a sample assessment on a patient that would meet the patient's medication administration needs.
- Have students perform an assessment that involves giving medications to another classmate or to a member of their family.

Objective 2

- Have students memorize and recite the five rights.
- Have students list how each of the five rights is checked in the local facility.
- Ask the students to discuss why these five pieces of documentation are called rights. Also, discuss why the five rights could also be called the five responsibilities.
- Place students in 5 small groups. Have each group present a short report on the value of one of the five rights.
- Discuss different methods of patient identification, and explain why one is the most accurate.
- Set up situations in which the patient denies his or her identity—in other words, the patient claims to have the

267

wrong arm band or the patient is simply avoiding his medication by denying his identity.

- Discuss the frequency with which identification checks should be performed. Tell students how often you expect ID bands to be checked or names to be clarified.

Objective 3

- Demonstrate the technique of verification at three points.
- Analyze the reason for the three medication checkpoints.
- Check the students for their understanding of the information on the medication label used during the administration of medications.

Objective 4

- Learn how medications are distributed by obtaining a policy book from your local facility.
- If various facilities are used, have students work in groups to research the types of systems the facilities use and how they are implemented in each facility.
- Discuss the advantages and disadvantages of each of the systems of medication distribution.

Objective 5

- Provide samples of each of the forms of medication.
- Have students determine the form(s) in which the most common medications are found.
- Discuss the purpose for which each medication form is used.
- Provide the students with several inhalers and have them read the different directions found on each one.
- While supervising, allow students to utilize the form of ammonia inhalants used in the local facility.

Objective 6

- Provide practice with each skill.
- Role play situations which require use of assessment to determine appropriate guidelines.

- Demonstrate each skill.

Objective 7

- Provide several sample syringes for viewing.
- Allow students to handle syringes. Teach the students the areas of the syringes that can be touched.
- Discuss the reasons for maintaining sterility of particular areas of the syringe.

Objective 8

- Discuss the reason television programs generally show excessively large syringes.
- Provide various needle and syringe sizes for viewing.
- Demonstrate loading of the most common cartridge in the local facility.
- Present descriptions of patients who need a specific injection and have students choose the syringe and needle that should be used.
- Provide the students with various cartridge syringes and medication inserts. Allow the students to practice inserting the cartridges.
- Discuss the safety precautions of the various cartridge syringes.
- Discuss the advantages and disadvantages of cartridge syringes.
- Have students locate various injection sites on each other.
- Use mannequins to demonstrate the common areas for injection.
- Stress conditions under which particular injection sites should be avoided.
- During clinical situations encourage students to identify the most appropriate site for each injection administered and provide the rationale.

- Discuss assessment data to analyze in choosing a site for injection.
  - route of administration (intradermal, subcutaneous, intramuscular)
  - rate of absorption
  - volume of the medication to be injected (larger volumes require larger muscle mass).
  - viscosity of the drug—oil base or thick medication should be administered slowly and most commonly in large muscle mass.
  - size and body weight of the patient.
- Discuss the major sources of patient discomfort associated with an injection and encourage students to explore methods for reducing the discomfort.

  Discussion should include:
  - position of the patient to facilitate access of the site without strain, and relaxation of the muscle group involved.
  - viscosity of the medication and the volume—large volumes and thick medications increase pressure and discomfort when injected and should always be administered slowly and not to exceed 2.5 - 3 cc per injection.
  - anxiety response reduces the patient's pain tolerance, thus the patient should be encouraged to relax and have confidence in the nurse prior to any injection.
  - needles should be changed after drawing up medication to reduce trauma with injection (must consider cost and hospital policy). If the needle is dulled, it must be changed.

Objective 9

- Discuss how the developmental level of the child affects the methods used in administration of medication.
- Demonstrate use of devices or methods of restraint used for infants and children during medication administration.

- Have students give techniques that they have seen or used and critique the technique based on the understanding of administering medications to children and infants.

Objective 10

- Place different liquids in medicine cups and have the students read the amounts of medication in the cups.

APPLICATION

Objective 11

- Have students role play taking medications and administering medications. Show appropriate and inappropriate responses.
- Relate personal experiences regarding communication during medication administration.

Objective 12

- Demonstrate the meniscus of different medications such as Maalox compared with KCl.

Objective 13 a

- Prepare an injection from a single or multi-dose vial.
- Demonstrate procedure.

Objective 13 b

- Demonstrate procedure for injection from an ampule.
- Stress importance of avoiding the sharp edges of the ampule, using filter needles, and safely discarding the ampule.

Objective 13 c

- Demonstrate the administration of sublingual medications.
- State the most common medications given by this route in the local facility.

Objective 13 d

- Demonstrate correct administration of buccal medication.
- Discuss why this procedure is rarely used.

Objective 13 e

- Demonstrate application of topical medication.
- Discuss variations that are commonly found in the local facility.

Objective 13 f

- Demonstrate the administration of eye medication.

Objective 13 g

- Demonstrate the administration of ear medication.
- Discuss the difference between adult and child ear medication administration.

Objective 13 h

- Demonstrate the administration of nasal medication.

Objective 13 i

- Demonstrate administration of oral medication.
- Discuss the importance of each step becoming habit in order to insure the correct administration of medications.
- Stress the importance of assessing the patient for the effects of the medication for documentation.

Objective 13 j

- Demonstrate procedure to crush medication.
- Identify medications used in facility that should not be crushed.

Objective 13 k

- Demonstrate procedure of administering medication by nasogastric tube.
- Stress importance of connecting tube to continuous feeding or maintaining the clamping of the NG being used for suction.

Objective 13 l

- Demonstrate procedure for administration of subcutaneous injection.
- Provide samples of the most common subcutaneous medication.

Objective 13 m

- Demonstrate procedure for administration of subcutaneous insulin.
- Stress the method used when handling insulin, the local policy about glucose levels, and the importance of patient teaching.

Objective 13 n

- Demonstrate procedure for administration of subcutaneous heparin.
- Stress local anticoagulant effects of heparin. Tell students whether or not ice is used in local facility for application before or after injection.

Objective 13 o

- Demonstrate procedure for administering intramuscular injection.
- Use mannequin for practice of injections.

Objective 13 p

- Demonstrate procedure for administration of medication by z-tract method.
- Discuss when z-tract should be used.

Objective 13 q

- Demonstrate procedure for administering intradermal injection.
- Have students observe and/or participate in local TB clinic.

Objective 13 r

- Demonstrate procedure for combined medications for injection.

- Use interaction chart from documentation unit.

Objective 13 s

- Demonstrate procedure for preparation of medication from dry medication using diluent.
- Have students list medications that are available in dry form.

Objective 13 t

- Demonstrate procedure for administering rectal suppository.
- Stress patient privacy and handling of suppository.

Objective 13 u

- Demonstrate procedure for administering vaginal medications.
- Discuss the indications for this form of medication and relate patient teaching.

EVALUATION

Pretest

- Pretest qualifying students.
- Determine individual study requirements from pretest results.
- Counsel students individually on pretest results and study requirements.
- Modify materials in unit or create supplementary material for individual students as required.

Practical Test

- Explain to students that they will be asked to demonstrate procedures on the job sheets to complete the practical test.
- Describe the rating scale used on the practical test.
- Reteach and retest as necessary.

NOTE: Each instructor is encouraged to set up the performance test using the equipment of each facility. Differences in availability of actual medications and the limited use of mannequins makes a standard performance test difficult. For some of the procedures, you may be able to have your students demonstrate the majority of the items on mannequins; however, for other procedures only patients may be used by your students with your close supervision. Instructors who use other students must consider the legal implications of giving medications without an order from a physician. Use the performance test to evaluate each student's ability to perform each procedure in a realistic setting. Some evaluation may be necessary in the clinical setting prior to a student's competencies being affirmed.

Written Test

- Explain to students that they will be asked to demonstrate on the written test the actions listed in specific objectives
- Give written test.

  NOTE: The written test may be given in sections if desired.
- Evaluate students on Assignment Sheet situation if not previously done.
- Reteach and retest if necessary.
- Complete appropriate section of competency profile.
- Review individual and group performance in order to evaluate teaching methods. Adjust scope, sequence, or institutional approaches for additional lessons as required.

UNIT RESOURCES

Publications

- Bayt, Phyllis Theiss. *Administering Medications: A Competency-Based Program for Health Occupations*. The Bobbs-Merrill Company, Inc., 1982.
- Clayton, Bruce D., Sock, Yvonne N. and Squire, Jessie E., *Squire's Basic Pharmacology for Nurses*. 8th Edition, C.V. Mosby Company, 1985.
- Lannon, Margaret C. and Acrangelo, Virginia Poole, *Essentials of Clinical Pharmacology and Dosage Calculation*, Second edition, J.B. Lippincott Company, Philadelphia, PA, 1986.
- Rice, Jane and Skeely Esther G., *Medications and Mathematics for the Nurse*, 6th edition, Delmar Publishers, Inc. 1988.
- Squire, Jessie E. and Clayton, Bruce D. *Basic Pharmacology for Nurses*, 7th edition, 1981. page 65.

- Woodrow, Ruth, *Essentials of Pharmacology for Health Occupations*, John Wiley and Sons, Inc., 1987.

UNIT REFERENCES

Publications

- Bayt, Phyllis Theiss, *Administering Medications: A Competency-Based Program for Health Occupations*. The Bobbs-Merrill Company, Inc., 1982.
- Clayton, Bruce D., Sock, Yvonne N. and Squire, Jessie E., *Squire's Basic Pharmacology for Nurses*. 8th Edition, C.V. Mosby Company, 1985.
- Lannon, Margaret C. and Acrangelo, Virginia Poole, *Essentials of Clinical Pharmacology and Dosage Calculation*, Second edition, J.B. Lippincott Company, Philadelphia, PA, 1986.
- Rice, Jane and Skeely Esther G., *Medications and Mathematics for the Nurse*, 6th edition, Delmar Publishers, Inc. 1988.
- Squire, Jessie E. and Clayton, Bruce D. *Basic Pharmacology for Nurses*, 7th edition, 1981. page 65.
- Woodrow, Ruth, *Essentials of Pharmacology for Health Occupations*, John Wiley and Sons, Inc., 1987.

PRETEST ANSWERS

ADMINISTER MEDICATIONS

IV

OBJECTIVE 1

1. c
2. c
3. d
4. d
5. c

OBJECTIVE 2

1. a
2. a
3. b

OBJECTIVE 3

1. b

OBJECTIVE 4

1. c
2. b

OBJECTIVE 5

1. a
2. d
3. b
4. e
5. c
6. b
7. a
8. a
9. a
10. b

OBJECTIVE 6

1. c
2. d
3. c
4. c
5. b

OBJECTIVE 7

1. d
2. a
3. h
4. c
5. e
6. b
7. i
8. g
9. j
10. f
11. k

OBJECTIVE 8

1. d
2. b
3. d
4. b
5. b
6. b
7. c
8. a
9. b

OBJECTIVE 9

1. b
2. c
3. c
4. d

OBJECTIVE 10

1. c
2. d
3. d

OBJECTIVE 11 Refer to answers to Assignment Sheet 1.

OBJECTIVE 12 Refer to answers to Assignment Sheet 2.

OBJECTIVES 13 a-u Refer to Practical Tests for Job Sheets 1 through 21.

PRETEST

ADMINISTER MEDICATIONS IV

NAME ______________________________ SCORE _______

OBJECTIVE 1

Utilize patient assessment data prior to medication administration. Write the letter of the correct answer in the blanks provided.

___ 1. If a patient is scheduled to go to physical therapy in 30 minutes, which aspect of assessment determines whether a pain medication will be given or not?

a. Drug tolerance

b. Present symptoms

c. Treatment goals

d. Body build

___ 2. Which group would require the largest amount of medication?

a. Infants

b. Children

c. Middle-age adults

d. Geriatric patients

___ 3. Which symptoms would indicate an allergic response?

a. Rash

b. Swelling of eyelids

c. Anaphylaxis

d. All of the above

___4. **Which factor should be most closely assessed when a dministering a placebo?**

a. Allergies

b. Body build

c. Physical state

d. Emotional state

___5. An antibiotic is being given to a patient. Which of the following admitting diagnoses would you expect?

a. Colon cancer

b. Myocardial infarction

c. Appendectomy

d. Diabetes mellitus

OBJECTIVE 2

Verify the five rights of medication administration prior to administering medication. Write the correct answer in the blanks provided.

___1. When a nurse is giving a medication which is new or unfamiliar to her, the first source of information should be:

a. a written drug reference

b. the charge nurse

c. the pharmacist

d. the physician

___2. At which of the following times is it UNUSUAL to check for correct name of medication?

a. After giving the medication

b. Upon locating the medication in the cart

c. While pouring the medication

d. When replacing the remainder of the medication

280

___ 3. The method of identification of the patient which is most accurate is:

a. the I.D. band

b. asking the patient his/her name

c. patient stating full name

d. reading the tag on the door

OBJECTIVE 3

Verify a medication during preparation. Write letter of the correct answer in the blanks provided.

___ 1. Routinely, how many times should a calculation be checked to determine that the dosage is correct?

a. One

b. Two

c. Three

d. Four

OBJECTIVE 4

Identify various systems of medication distribution. Write the letter of the correct answer in the blanks provided.

___ 1. Which system of medication distribution is most frequently found in nursing homes?

a. Floor stock

b. Unit dose

c. Individual prescription order system

d. None of the above

___ 2. When using unit dose system, restocking or exchanging carts is usually done every

a. 8 hours

b. 24 hours

c. 3 days

d. 1 week

OBJECTIVE 5

Identify the various forms of medication. Write the letter of the correct answer in the blanks provided.

____1. Liquid that contains oils and fat in water.

____2. Sweetened, flavored liquid medication

____3. Drug in gelatin-type container

____4. Particles which dissolve in a specified length of time

____5. Compressed disk of medication

a. emulsion

b. capsule

c. tablet

d. syrup

e. time-release capsule

f. grain

g. hypodermic

h. spirits

____6. A buccal tablet is placed

a. Under the tongue

b. Between the cheek and gum

c. Between tongue and cheek

d. In the axilla

____7. The most common type of drug given in gas form is

a. anesthetics

b. antihistamines

c. bronchodialators

d. cathartics

____8. Which container of injectable medications is solid glass and contains a single dose of medication?

a. Ampule

b. Vial

c. Cartridge

d. All of the above

___ 9. Which type of solution has a water base?

a. Aqueous

b. Hydrous

c. Lipous

d. Viscous

__ 10 Which form of medication administration equipment should be used for a 20 cc dose of Maalox to an adult?

a. Souffle cup

b. Plastic medicine cup

c. Syringe

d. Mortar

OBJECTIVE 6

Select appropriate guidelines for administering medications other than injections. Write the letter of the correct answer in the blank provided.

__ 1. The most common type of medication is

a. sublingual

b. buccal

c. oral

d. topical

___ 2. In order to administer a crushed medication safely it s commonly combined with

a. Chocolate cake

b. coffee

c. cola

d. applesauce

____3. Patients may require administration of medication through a nasogastric tube when they are

a. comatose

b. unable to swallow

c. both a and b

d. none of the above

____4. To apply medicated lotions they should be

a. rubbed

b. sprayed

c. patted

d. ask patient for most comfortable

____5. Ophthalmic medications are introduced into the

a. ear

b. eye

c. nose

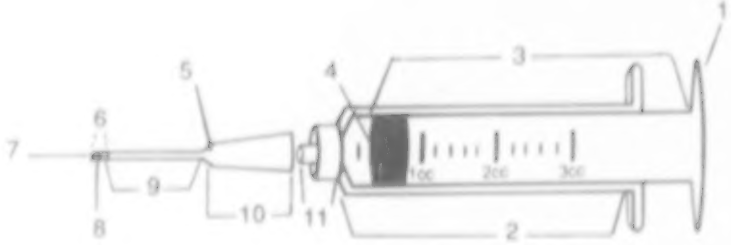
d. none of the above

OBJECTIVE 7

Identify the parts of a syringe and needle. Write the letter of the correct answer in the blank provided.

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______
11. ______

a. Barrel
b. Bevel
c. Calibration
d. Flange
e. Hilt
f. Hub
g. Lumen
h. Plunger
i. Point
j. Shaft
k. Tip



__ 12. Which of the following parts of the syringe is sterile?

a. Flange

b. Barrel

c. Tip

d. Calibrations

OBJECTIVE 8

Select appropriate guidelines for administering intramuscular, subcutaneous, and intradermal injections. Write the letter of the correct answer in the blank provided.

____1. The preferred subcutaneous site when administering heparin is

a. upper thigh

b. upper arm

c. fatty portions of gluteal area

d. fat pads of the iliac crests

____2. The intradermal area used for tuberculin injections is:

a. upper arms

b. lower arms

c. upper back

d. lower back

____3. The deltoid injection site is located

a. on the anterior lateral thigh

b. medially to the vastus laterals

c. on the upper, outer quadrant of the gluteal area

d. three finger breadths below the acromion process

____4. The rectus femoris injection site is located

a. on the anterior lateral thigh

b. medially to the vastus laterals

c. on the upper, outer quadrant of the gluteal area

d. three finger breaths below the acromion process

____5. Which of the following areas is a subcutaneous injection site

a. deltoid

b. fat pads of the iliac crest

c. upper back

d. none of the above

___ 6. Which needle would be the best choice to use for administering an insulin injection to a 150 pound woman?

a. 3/8" 27 g

b. 1/2" 25 g

c. 5/8" 23 g

d. 1" 22 g

___ 7. If giving a heavy medication such as penicillin IM which needle would be the best choice?

a. 1/2" 25 g

b. 1" 22 g

c. 1 1/2" 22 g

d. 1 1/2" 18 g

___ 8. Which intramuscular site has the smallest capacity in the adult?

a. deltoid

b. vastus lateralis

c. ventrogluteal

d. dorsogluteal

___ 9. The maximum amount injected subcutaneously

a. 1cc

b. 2cc

c. 3cc

d. 4cc

OBJECTIVE 9

Identify methods used when administering medications to a young child or infant. Write the letter of the correct answer in the blank provided.

____1. The site of choice for intramuscular injections in infants and small children is the

a. deltoid

b. vastus lateralis

c. ventrogluteal

d. dorsogluteal

____2. Which statement would be best when administering medication to a 4 year old child?

a. "Take this, this medicine is like candy."

b. "If you don't drink this you will have to have a shot."

c. "This is medicine, it is to help you get well."

d. "Act grown-up and take this medicine."

____3. The only way to identify an infant is to

a. ask the charge nurse

b. read the chart

c. read the ID band

d. none of the above

____4. When administering medications to infants

a. use a medicine glass

b. pinch the nose

c. leave the infant on his/her back

d. none of the above

OBJECTIVE 10

Identify methods used to read a medicine glass. Write the letter of the correct answer in the blank provided.

___ 1. A positive meniscus within a container is

- a. when the top of the fluid is even.
- b. a curve at the top of the fluid that dips in the center.
- c. a curve at the top of the fluid that bulges
- d. all of the above.

___ 2. Most medicine glasses are labeled

- a. apothecary measurements only
- b. apothecary and metric measurements
- c. metric, household, and binary measurements
- d. household, metric, and apothecary measurements

___ 3. To read a medicine glass correctly you must

- a. disregard the meniscus
- b. hold the glass above your head
- c. use the highest point to determine the amount
- d. use the lowest point to determine the amount

NOTICE

In addition to the pretest items, the students will be required to demonstrate mastery of the following objectives.

OBJECTIVE 11

Communicate appropriately during administration of medication. SCORE _____

OBJECTIVE 12

Read a medicine glass. SCORE _____

OBJECTIVE 13 a

Prepare an injection from a single or multi-dose vial. RATING ____

OBJECTIVE 13 b

Prepare an injection from an ampule. RATING ____

OBJECTIVE 13 c	**Administer sublingual medications.**	RATING ___
OBJECTIVE 13 d	**Administer buccal medication.**	RATING ___
OBJECTIVE 13 e	**Administer topical medication.**	RATING ___
OBJECTIVE 13 f	**Administer eye medication.**	RATING ___
OBJECTIVE 13 g	**Administer ear medication.**	RATING ___
OBJECTIVE 13 h	**Administer nasal medication.**	RATING ___
OBJECTIVE 13 i	**Administer oral medication.**	RATING ___
OBJECTIVE 13 j	**Crush medication for administration.**	RATING ___
OBJECTIVE 13 k	**Administer medication by nasogastric tube.**	RATING ___
OBJECTIVE 13 l	**Administer subcutaneous injection.**	RATING ___
OBJECTIVE 13 m	**Administer subcutaneous insulin.**	RATING ___
OBJECTIVE 13 n	**Administer subcutaneous heparin.**	RATING ___
OBJECTIVE 13 o	**Administer intramuscular injection.**	RATING ___
OBJECTIVE 13 p	**Administer medication by z-tract method.**	RATING ___
OBJECTIVE 13 q	**Administer intradermal injection.**	RATING ___
OBJECTIVE 13 r	**Combine medications for injection.**	RATING ___

OBJECTIVE 13 s	**Prepare injection from dry medication using diluent.**	RATING ____
OBJECTIVE 13 t	**Administer rectal suppository.**	RATING ____
OBJECTIVE 13 u	**Administer vaginal medication.**	RATING ____

OBJECTIVE 1

Utilize patient assessment data prior to medication administration.

The most important information needed when giving medication is the patient's individual characteristics. All other information about the medication must be considered in relation to the patient.

Prior to administering any medication, you must assess the patient. There are many variables that you must consider with each patient. Listed below are some of the variables that you should consider.

- **Allergies**—All patients should be asked about drug allergies, and caution should be used if this is the patient's first time for a type of medication.
- **Age**—Age affects the rate of metabolizing medication. Older adults metabolize medication slowly. Infants and young children may metabolize very rapidly.
- **Body build**—Body weight, as well as percentage of lean tissue, affects metabolizing of medication.
- **Desired effect**—The effectiveness of the medication needs to be continuously assessed.
- **Diagnosis**—Diseases may change the way a medication is utilized.
- **Drug interaction**—Although interactions may be individualized, you are responsible for noting common drug interaction.
- **Drug tolerance**—Tolerance can be assessed only after administration of the medications. Tolerance is highly individualized and should be watched closely; you should also be aware of patient's reaction to previous use of the drug. Drug tolerance changes significantly during the aging process.
- **Emotional state**—The emotional sensitivity of a patient may affect how that person perceives the medication and how effective the medication is for treating the illness.

- **Indication**—You should know the reasons for a particular patient receiving a medication.
- **Medication history**—The history should be reviewed by each nurse administering medications so that each nurse will be aware of the patient's individual differences.
- **Patient knowledge**—Discussion of the patient's understanding of the medication should occur during all phases of giving the medication. The nurse has great impact on patient knowledge through patient teaching.
- **Physical state**—A patient's physical ability to tolerate a drug or the route being used may require changes in medication. A patient who is vomiting cannot take medication orally, changes in route must be made.
- **Present symptoms**—Some symptoms may indicate drug toxicity or other contraindications to giving medication or may indicate need for more effective medication.
- **Timing of dosage**—Procedures that are scheduled for the patient may necessitate giving the medication before the procedure or holding the medication because of the procedure or treatment.
- **Treatment goals**—Long term goals of medication treatment should be considered when administering medication.

OBJECTIVE 2

Verify the five rights of medication administration prior to administering medication.

After thorough assessment of the individual patient, you can prepare to administer the medication. First, you must check that the five rights have been met. You should know all of the following:

- **Patient's name**—You must be certain that the correct patient is receiving the correct medication. To verify the patient's name, you should
  - Use the name on the chart
  - Match the chart name with the medication card/sheet
  - Identify the patient with the ID band
  - Ask the patient his/her name—It is always best to ask the patient for his full name.

- **Medication**—The nurse is responsible for knowing about the medication prior to administering it. If uncertain, you should use references to obtain this knowledge.
- **Dosage**—The dosage should fall within the normal range. Any calculation should be double checked.
- **Route**—The route should be verified by comparing the original order, the medication card/sheet, and the form available. All given information should coincide.
- **Time**—The time should follow procedure for routine, prn, or other forms of order according to your facility's policy and the needs of the individual patient.

OBJECTIVE 3

Verify a medication during preparation.

Because the five rights must constantly be considered, it is standard procedure for the practical nurse to triple check medications when preparing to administer them. You should check the medication in the three following procedures:

- When you obtain the medication from the drawer or cabinet
- While you're pouring the medication
- When you return the medication to the cabinet

This decreases the chance of an incorrect medication being used.

NOTE: It is important to emphasize the extreme importance of each step.

Another system which maintains the 5 rights is the verification of the identity of the patient. The nurse should check the identification bracelet and also verbally check that the patient's name is the same as the person for whom the medication is ordered. It is always best to ask the person for the full name, but it is acceptable to call the name and ask whether it is correct. It is very important to be certain the right patient is receiving the medication. If the 5 rights are not followed, medication errors will occur.

The nursing interventions required when a medication error occurs should include:

1. providing safety for the patient specific to the drug involved.
2. notifying the charge nurse and the physician.

3. on-going assessment of the patient to determine effects of the drug.

4. proper documentation in the patient chart.

5. the use of incident reports to avoid future errors.

OBJECTIVE 4

Identify various systems of medication distribution.

In addition to information about the patient and the medication, you must be familiar with the system of medication distribution within your facility. At this time, three major systems of medication distribution are being used.

- **Floor Stock System**—This system is most frequently found in smaller facilities and provides medication in larger quantities or stock medications, with the exception of dangerous or rare medications.
- **Individual Prescription Order System**—This system provides medications for several days for an individual patient. Changes are made by prescription. The medications for the individual patient are arranged together. This is usually found in nursing homes or home use.
- **Unit Dose System**—This system uses single unit packages of drugs that are dispensed to fill each dosage requirement as it is ordered. The individual packages are fully labeled and kept in an individual patient's drawer. Usually, the drawer is refilled every 24 hours.

Whichever system is used, you must be familiar with it and follow all of your facility's policies to prevent erro from occurring.

OBJECTIVE 5

Identify the various forms of medications.

Medications can be found in a variety of forms. You should become familiar with the form in which each medication is made. Below is a description of the various forms of medications.

ORAL

- **Tablet**—Disk of compressed dry drug that varies in shape; may be scored for division

- **Capsule**—Drug placed in gelatin-type container
- **Enteric-coated tablet**—Tablet with special coating that is resistant to breakdown in the upper GI tract
- **Time-release (sustained-release) capsule**197Coated capsule, containing drug particles, that dissolves in a specified length of time
- **Lozenge (troche)**—Flavored tablet for local effect on throat or mouth

  NOTE: Lozenges should NOT be swallowed.
- **Suspension**—Liquid medication that requires shaking because settling of drug particles occurs
- **Emulsion**—Liquid medication that contains oils and fats in water
- **Elixir, fluid extract**—Liquid medication with alcohol base
- **Syrup**—Liquid medication that is sweetened and flavored
- **Solution**—Liquid medication in which drug is evenly dissolved and appears clear

RECTAL

- **Suppository**—Drug suspended in a substance that melts at body temperature
- **Enema solution**—Drug suspended in solution to be given as an enema

TOPICAL

- **Transdermal patch**—Medication applied to the skin and absorbed over a long period of time
- **Ointment**—Semi-solid preparation of drug for external application
- **Liniment**—External application that acts as counterirritant
- **Lotion**—Liquid preparation of drug for external application

MUCOSAL

- **Eye, ear, and nose drops**—Liquid medication that is made for administration into specified area

- **Eye ointment**—Sterile semi-solid preparation for ophthalmic use only

- **Vaginal creams**—Medicated cream to be applied to the vagina with use of a special applicator

- **Vaginal suppositories**—Drug suspended in substance that melts at body temperature for local effect on vagina

- **Douche solution**—Sterile solution used to irrigate vaginal canal

- **Buccal tablet**—Tablet made to be placed between the cheek and the gum

- **Sublingual tablet**—Tablet made to be placed under the tongue

INHALANT

- **Spray or mist**—Liquid drug form to be inhaled as fine droplet by use of spray bottles or nebulizers

- **Gas**—Anesthetics to be inhaled for general anesthesia

- **Powder**—Powder form of drug administered through an inhaler

The method of delivering medications with inhalers varies greatly. For this reason, it is essential for you to carefully read the instructions and package inserts included in each brand of inhaler before using it. The respiratory stimulant aromatic ammonia (smelling salts) is also an inhalant form of medication and should be used carefully. Usually, only a whiff is needed for a patient to respond. Each nurse should become aware of the facility's policy on when to use ammonia inhalants and how to use the particular form available.

INJECTABLE

- **Ampule**—Small, solid-glass container that holds a single dose of sterile solution for injection

- **Vial**—Small, glass single or multi-dose container of drug that is sealed with a rubber stopper

- **Cartridge injectable**—Single dose of drug in a glass container that fits into a particular syringe

- **Aqueous solutions**—Solutions with a sterile water base

- **Viscous solutions**—Solutions with an oil base

You must be familiar with the different forms of medications and the equipment used to administer each form. For oral medications, paper souffle cups or plastic medicine cups may be used. The nurse should become thoroughly familiar with reading medicine cups to insure accurate dosages. With injections, the nurse must not only be able to recognize a syringe, but should be able to distinguish the parts that can and cannot be handled during its use.

OBJECTIVE 6

Select appropriate guidelines for administering medications other than injections.

Oral Medication

Oral medication is the most common form of medication. Most people have taken medication by oral form at some time in their lives. It is your responsibility to routinely check the five rights and verify medication three times when administering all medications. Additionally, it is also your duty to continually instruct every patient about his medication.

You must be aware that there are differences in how people take oral medication. Some people prefer water between medications, others will take several medications at the same time, and others will take their medications in a particular order. Write these individual differences in the nurse's notes so that they will be communicated to the staff. Also, recording these individual differences will serve as a documentation of the patient's interaction with medications.

To administer oral medication, follow the guidelines below.

- If possible, do not touch oral medication.
- Do not open unit dose oral medication until the patient is ready to take it.
- When solid medication is kept in stock containers, first pour the number desired into the container's cap, and then transfer them to the medicine cup.
- When administering liquid medication, remove the cap and place it upside down on the medicine cart. Then, place the medicine cup at eye level with the label turned away—this prevents the medication from dripping down the label and making it illegible. Pour the medication into the medicine

cup. When ready to give the medication, use the medicine cup to pour the medication into the patient's mouth. Some patients will need to use their own fingers to take their medications. Use your own judgement to find what best meets the patient's need.

Frequently, patients are unable to take solid forms of oral medication. For this reason, you may have to crush medications. You should also check with the pharmacy to see if the medication is available in liquid form—if liquid is available, have the physician approve its use prior to ordering it.

You should determine whether or not a particular medication can be crushed and maintain its effectiveness. To determine this, use references and consult the pharmacist. Enteric-coated tablets and timed-release capsules should not be crushed. You must also determine what substances a crushed medication can be combined with for safe administration. Common substances for this use included ice cream, sherbet, apple sauce, water, and juice.

Two devices exist for this purpose—1) the mortar and pestle and 2) the medication crusher. The mortar is a heavy bowl usually made of porcelain and the pestle is a short solid stem with a smooth rounded surface on the lower edge.

There are several ways to actually crush the medication. To crush medication efficiently, follow the guidelines below

- When using a mortar and pestle: Place the tablet in the mortar. Then, use the pestle to crush the medication.
- When using a medication crusher: Place a souffle cup in the area provided. Place the medication in the souffle cup and lower the handle of the crusher until the pressure crushes the tablets. You may need to turn the souffle cup to avoid pressing the medication into tablet form again.
- Transfer the medication to a medicine cup.
- Clean the crushing device thoroughly.
- Add to appropriate food or liquid.
- From this point, follow standard procedure for administering oral medications.

Medication through nasogastric tube

Patients who are unable to swallow, are comatose, or have a disorder of the esophagus may require administration of medication through a nasogastric tube. Usually, the medications to be administered in this fashion will be in liquid form. If not, you may have to crush tablet medication and add it to a liquid or, in the case of capsule medication, separate the capsules and dissolve the powder in water. Avoid using medication that cannot be safely crushed when administering medication through the nasogastric tube.

To administer medication by a nasogastric tube, follow the guidelines below.

As with administration of any liquid into a nasogastric tube, **check the placement of the tube prior to administering the medication.** The N/G tube should be clamped, enabling you to attach a large syringe with a catheter tip.

- Use water (approximately 30 cc) to clear the tube, and check for patency by unclamping the tube once the water is in the syringe.
- Because the medication enters the patient by the flow of gravity, you may be required to reposition the patient if the tube is against the wall of the stomach.
- Add the medication to the syringe.
- Air should not be allowed to flow into the N/G tube. This can be accomplished by clamping the tube as soon as the liquid has entered the patient.
- Clamp the N/G tube.
- Flush the tube with water.
- Immediately reattach continuous feeding. However, **do not reattach suction for 30 minutes.**

Sublingual Medications

One of the most common medications found in sublingual form is nitroglycerin tablets. These are used for angina. Although few medications are available in sublingual form, you must be able to administer those that are.

Sublingual medications work very rapidly and should not be confused with oral medications, which work much slower. Sublingual tablets are placed under the tongue. Their absorption is rapid because the area under the tongue is highly vascularized.

Buccal Medication

Although buccal medications are very rare, you should know the basic procedure for administrating them. Buccal medications are tablets that are placed between the cheek and the gum where they are allowed to dissolve. This type of medication should not be swallowed; moreover, **you should not allow the patient to have any food or drink until the medication is completely dissolved.**

Topical Medication

Topical medications take many forms. The most common forms are ointments, creams, lotions, liniments, liquids, and powders.

- Ointments, creams, lotions, and liniments are rubbed onto the skin. Usually, a thin covering is applied unless specified otherwise in the orders.
- Liquids may be swabbed, sprayed, or painted onto the tissue.
- Powders, which are used infrequently, are blown onto a tissue from the dispensing container.

You need to become familiar with the correct application of the specific topical medication being used. You should also seek to understand the desired effect the medication should have on the patient.

To apply topical medication, follow the guidelines below.

- Wear gloves to apply skin medications. If you experience irritation or itching while wearing gloves, use snug-fitting gloves, as they will cause less discomfort.
- Unless specified otherwise, remove old topical medications prior to reapplication.
- Medicated lotions should be patted not rubbed.
- Do not use gauze to cover the medicated area, because this may cause additional irritation.

- When applying medications to burns, use the sterile technique with sterile gloves to apply the medication. Burns require a gentle, light touch due to pain.
- Regardless of the reason for the topical medication, you should follow the physician's order on whether to cover the area or leave it open to the air. If uncertain of the physician's intention, ask the charge nurse first, and then call the physician if needed.

Eye Medication

Medications which are introduced into the eye are referred to as ophthalmic medications. It is essential that these medication be sterile and should be labeled as "Sterile—For Ophthalmic Use". It is also necessary for each patient to have his or her own bottle or tube of eye medication.

The most common forms of ophthalmic medications are drops (solutions) and ointments. It is best if these are administered at room temperature. Solutions usually do not interfere with vision but ointments may alter visual acuity.

The medication will be ordered to be given O.D.(right eye), O.S. (left eye), or O.U. (both eyes). After the correct site is determined and the five rights have been double checked, the patient should be informed of the procedure. It is necessary to gain the patient's cooperation during administration of eye medications to decrease potential trauma.

Ear Medication

Most ear medications are in solutions and are administered by instillation of drops into the outer ear canal. This medications should be labeled as otic drops.

Prior to administering an ear medication it is necessary to determine that wax is not blocking the ear canal. If there is excess wax, it is necessary to obtain an order for irrigation. The exception to this is if the medication being given dissolves wax. If the ear canal is open the medication should be given. It is always necessary to warm ear medications to room temperature.

After the medication has been warmed and prepared using the 5 rights the nurse may proceed. The patient is instructed on the procedure. The affected ear is positioned upward. The earlobe is then pulled to straighten the outer canal. In children under 3 years old this is done by pulling the earlobe down and back, in people over 3 years old the earlobe is pulled up and back. The prescribed number of drops are instilled into the ear avoiding touching any part of the ear with the dropper. The patient remains positioned with the affected ear up for a few minutes. Cotton plugs are inserted only if ordered.

Nasal Medication

Nasal medications are available in several forms. Sprays and nose drops are the two most common. Sprays coat the membrane better and have less loss, but drops are effective especially with younger children.

Prior to administration, the patient must gently blow the nose. Drops are administered with the head tilted far back with the patient remaining in this position for 2-3 minutes after the drops are instilled. Spray is administered with the head erect and one nostril blocked. It is necessary to shake the spray prior to use and hold the bottle upright. The patient must inhale through the open nostril at the same time the puff is given. It is best for either medication if blowing the nose can be delayed.

Rectal Suppository

Rectal suppositories have many uses and are a preferred form for many medications. You should always remember that suppositories are medications and should be used carefully. Suppository medication is made to melt at body temperature; therefore handling them should be kept to a minimum.

Usually, suppositories are packaged in individual foil packs. These individual foil packs should not be opened until you are in the patient's room. To avoid holding the suppository, which will cause it to melt, place the package in a medicine cup.

The suppository should be checked as any medication for the five rights.

To administer a rectal suppository, follow the guidelines below.

- Check the patient's understanding of the purpose of the suppository.
- Give the patient instructions to lay on his left side, unless you are required to position him yourself.
- Put on gloves.

- Lubricate the suppository before inserting it into the rectum. A water base lubricant is generally recommended. Use only enough lubricant to ease insertion. It is unnecessary to completely cover the suppository in lubricant.
- You should be familiar with the shape of suppositories and know that the curved end is inserted first.
- When inserting the suppository, insert it past the internal rectal sphincter about 1 inch.
- After administration, instruct the patient to remain on his side for approximately 20 minutes. Children may need assistance holding the suppository in—this can be accomplished by pressing the buttocks together.

Vaginal Medication

Vaginal medications are used for local treatment of gynecologic disorders. Except for some vaginal suppositories, most vaginal medications come with an applicator. The vaginal suppositories can be inserted into the vagina with a gloved index finger.

To administer vaginal medications, follow the guidelines below.

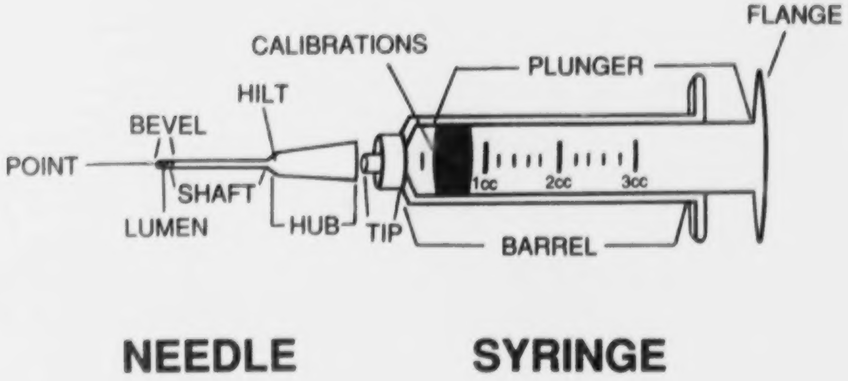
- The patient's bladder should be empty.
- The preferred position for the patient is the lithotomy position.
- Have the patient remain in this position for 10 minutes with a perineal pad underneath her to be available for any drainage.
- You should be aware of the placement of the vagina and assess the patient's symptoms.
- You should maintain the patient's privacy and dignity during the procedure.

OBJECTIVE 7

Identify the parts of a syringe.

The nurse must be familiar with the equipment necessary to administer each form of medication. With injections the nurse must not only be able to recognize a syringe and its parts but should also be able to distinguish the parts which can and can not be handled during use.

The parts of the syringe and needle are listed below


FLANGE
CALIBRATIONS
PLUNGER
HILT
BEVEL
POINT
1cc
2cc
3cc
SHAFT
LUMEN
HUB
TIP
BARREL
NEEDLE
SYRINGE

The parts of the syringe that are sterile and should not be touched during preparation and administration of medications are

- Needle
- Tip
- Inside of the barrel
- Plunger

Only the flange of the plunger and the outside of the barrel can be handled. Practice is required in becoming competent and comfortable with maintaining sterility of the appropriate parts.

OBJECTIVE 8

Select appropriate guidelines for administering intramuscular, subcutaneous, and intradermal injections.

Injectable medication is commonly contained in single or multi-dose vials or single dose ampules

AMPULES

Ampules are solid glass containers that contain medication. Although ampules are becoming less common, some injectable medication is still packaged in this manner. The amount of medication contained in an ampule is usually one dose.

Caution should be used anytime ampules are broken because defects can occur causing the glass to break abnormally.

The neck of the ampule must be broken to gain access to the medication. Because breaking the neck can be dangerous due to shivers of glass, several precautions must be used. Use the following guidelines.

- Before attempting to break the neck, have all of the medication in the lower part of the ampule.
- To make the break easier, file the neck of the ampule prior to breaking it.
- Anytime an ampule is broken, use a gauze sponge around the neck of the ampule. This will protect you from slivers of the glass.

To withdraw medication from an ampule, follow the guidelines below.

- To protect the medication from containing glass shivers, use a filter needle when withdrawing the medication.
- As with drawing any injection, keep the needle within the fluid during drawing.
- After medication has been removed from the ampule, discard the ampule in a puncture resistant container.
- Clear the filter needle of medication by pulling the plunger back. The filter needle can then be replaced by a needle of appropriate length and gauge.
- Push the plunger forward slowly until a drop of medication appears at the end of the needle and the correct dosage is achieved.

One of the more interesting aspects of working with ampules is that they are to be inverted, just like vials, when withdrawing the medication. Some people prefer to leave the ampule sitting on the cart, but this is not necessary. The ampule is designed to prevent the medication from leaking out when it is inverted.

VIALS

Injectable medication is commonly contained in single or multi-dose vials. Vials are containers, usually glass, that are sealed with a rubber stopper.

Always check the date on the vial and determine if it is good for use according to your facility's policy. Most vials have a metal band around the top with a protective covering over the rubber portion when unused. This protective covering must be removed before a needle can be inserted into the vial. To remove the covering, follow the instructions on the label, or use the fleshy part of your thumb to push back on the covering.

After the covering has been removed, the rubber stopper should be cleaned with alcohol, using a single rotation of the alcohol swab. The alcohol should be given time to dry before the needle is inserted.

To prepare an injection, you should

- Remove a sterile syringe from its packaging sheath
- Handle only the barrel, the flange of the plunger, and the needle cap during preparation of the injection
- Push the plunger up within the barrel to assure that the barrel is free of obstructions near the end
- Pull the plunger back to the desired amount of medication
- Remove the needle cap and insert the needle into the center of the vial. If a multi-dose vial is being used, avoid previous puncture sites.
- Keep the level of the lumen of the needle within the air space and inject the air in the vial
- With the label toward you, as well as the calibrations on the syringe visible, withdraw the medication slowly. The needle must stay within the fluid to withdraw medication.

If air is drawn into the syringe, several methods are available for removing it.

- The syringe can be flicked to move the air to the top of the syringe. Then, the plunger can be pushed to inject the air back into the vial. Caution should be used when flicking small gauge needles since they bend very easily.
- Another method of removing air is to slowly inject the contents of the barrel back into the vial until the air is removed and begin withdrawing medication again.

You should NOT remove the needle from the vial for any reason until the dosage is correct. The dosage read on the calibration of the syringe should be exactly the same as the desired dosage. When this is correct, the needle can be removed, and the cap can be carefully placed on the needle.

DRY MEDICATIONS

Some medications come in dry form and, therefore, must have diluent added to them before being used as a solution. Dry form medication is produced because some medication does not store well in mixed form. For this reason, do not prepare dry form medication until it is needed for use. Consult a pharmacist if a delay occurs between the preparation and use of dry form medications.

Most diluents come in multi-dose vials; therefore, these diluents may be drawn according to the multi-dose vial procedure. Attention should be paid to the amount of diluent needed for the particular medication, as well as using the correct diluent. The most common diluents are sterile water and sterile saline for injection. Before choosing a diluent, you should read the medication label, which will specify the proper diluent to use.

To prepare an injection from dry medication using diluent, follow the guidelines below.

- Draw the correct amount of diluent.
- Change needles.
- You may need to tap the vial of dry medication to break up the powder, as it has a tendency to cake.
- Clean the top of the dry medication vial with an alcohol swab. Allow top of vial to dry.

- Insert the needle, and add the diluent to the dry powder.
- Following the directions on the vial, mix the medication thoroughly until the powdered drug dissolves.
- Draw the desired amount of medication.

COMBINING MEDICATIONS

Frequently, medication orders are written for an injection that combines two medications. There are some injectable medications that can be combined and others that cannot be combined with any other medication. It is your responsibility to know which medication is compatible and which medication is not. If this information is not known or available on the unit, you should contact the pharmacist.

Prior to drawing two medications, you must use calculation skills to determine the total amount that will be in the syringe when the procedure is completed. To determine the total amount, add the first medication amount to the second medication amount.

The order of withdrawing and combining the medication depends on the medications to be combined and the packaging of each medication.

WARNING: Great caution should be used if both medications are from multi-dose vials.

None of the first medication drawn can be allowed into the multi-dose vial of the second—the second medication must be drawn perfectly on the first attempt. The same principle applies if a single-dose vial or an ampule is used for the second medication and the dosage does not require the complete contents of the container. Usually, you should draw from the single dose container last, which would cause less waste if an error occurred.

It is in the drawing of the second medication that technique must vary slightly from simply withdrawing a medication.

- Once the needle is placed into the vial of the second medication, maintain a slight traction on the plunger. This traction will keep the potential vacuum in the vial from pulling the first medication in.

- When removing the needle, there may be a small amount of spray before the rubber stopper seals because the vacuum is being released. Be sure to shield your eyes during this process.

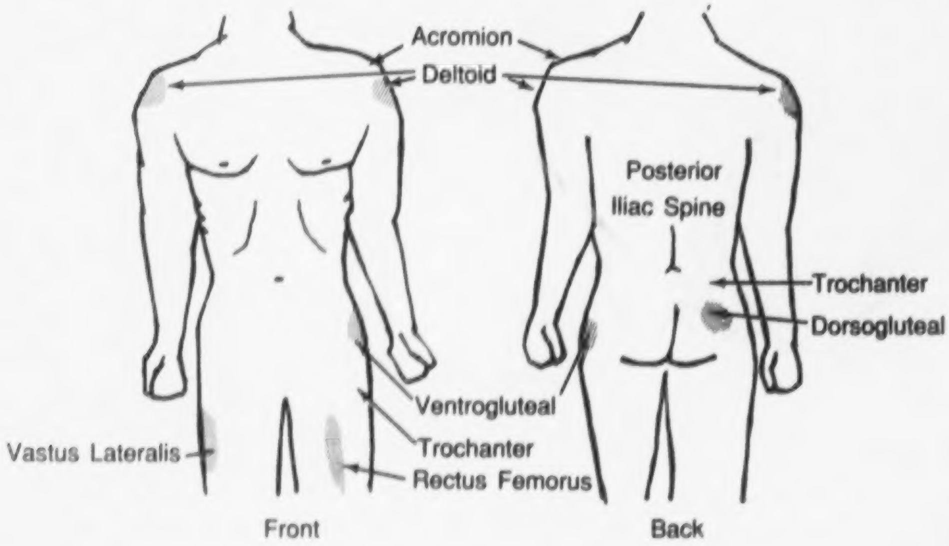
Mixing regular and NPH insulin

For some diabetics it is necessary to give two insulins which act at different times. The most common combination is regular and NPH insulin. When drawing these two insulins together it is necessary to draw the shorter acting insulin (regular) first and the longer acting (NPH) last. This is done because the longer acting insulin can absorb shorter acting insulin, but the shorter acting cannot absorb the longer acting form. If other insulins are to be combined the pharmacist should be consulted to determine their compatibility.

SITES

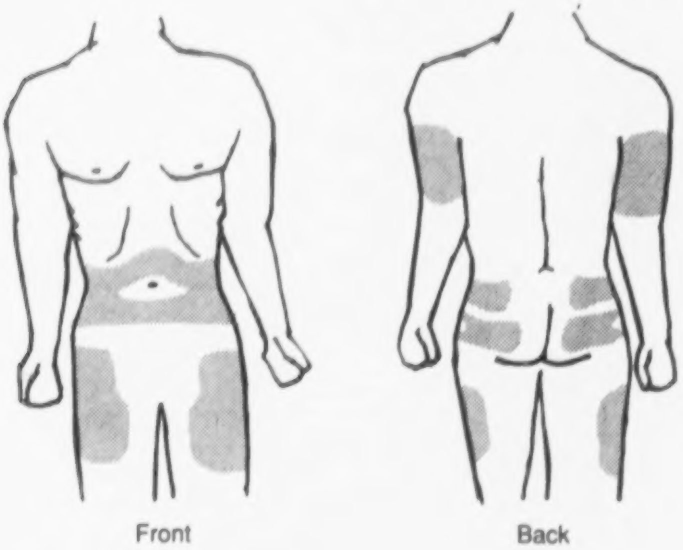
In order to administer injections correctly, you must be able to choose the proper site for an injection. The diagrams below show the common sites for the specified injections.

Intramuscular


Acromion
Deltoid
Posterior
Iliac Spine
Trochanter
Dorsogluteal
Ventrogluteal
Vastus Lateralis
Trochanter
Rectus Femorus
Front
Back

- **Deltoid**—Located three finger breadths below the acromion process. This area has the smallest capacity in the adult. (medication must be less than 2 cc and non-irritating)
- **Vastus Lateralis**—Located on the anterior lateral thigh between one handbreadth below trochanter and one handbreadth above the knee (site of choice in infants)
- **Rectus Femoris**—Located medially to the vastus lateralis. Method of location is same area except more toward midline without crossing the midline
- **Ventrogluteal**—Uses gluteus medius muscle, located by forming "V" with fingers; palm on lateral trochanter, index finger on anterior superior iliac spine and middle finger extended to iliac crest (not to be used with children under 3)
- **Dorsogluteal**—Upper, outer quadrant of the gluteal area; must be above and outside a line from greater trochanter to the posterior iliac spine (not to be used with children under 3)

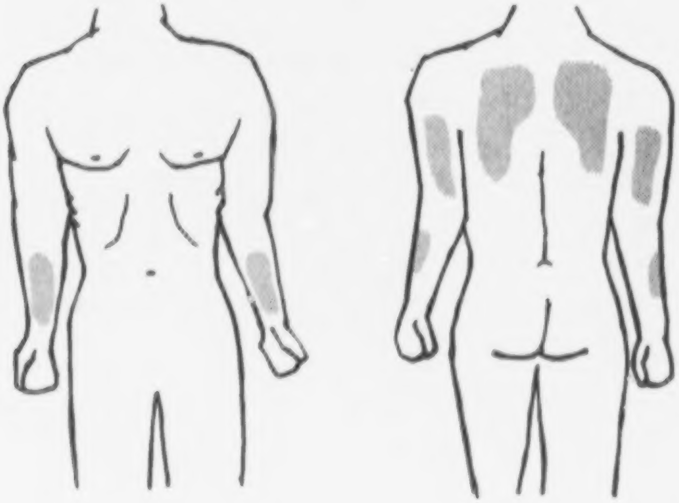
Subcutaneous Sites



The sites of subcutaneous injections vary, but the most common sites are the abdomen, the thighs, and the upper arm.

Intradermal Sites

Intradermal medications are usually given to test for sensitivity. Allergy testing on the back and tuberculin testing on the lower arm are the most common. The sites are chosen by purpose of testing.



SELECTION OF NEEDLE AND SYRINGE

When choosing the syringe and needle, you must once again consider the individual patient, as well as the medication being used for injection. Needles are chosen according to their length and their gauge. The length of the needle is determined by

- The route used
- The patient
- The type of injection
- The medication being given
  - Intradermal and subcutaneous injections generally require needles from 3/8" to 5/8" in length.
  - Intramuscular needles vary greatly in length depending on the patient and the location of the injection but are

312

generally 1/2" to 2". Children are those most likely to need the shortest length.

The gauge of needles is the diameter of the lumen of the needle. The smaller the lumen, the larger the number of the gauge. The gauge of the needle is determined by

- The route of injection
- The medication used
- The type of injection
  - Intradermal and subcutaneous injections require the smaller gauges, usually 25-27.
  - Intramuscular injections may use a gauge from 21-25 depending on the viscosity of the injection.

  EXAMPLE: Use larger gauges of needles for heavy antibiotics to prevent needle blockage.

To choose the appropriate syringe for an adult, you should consider

- The amount of medication being given
- All syringes for injection (other than intravenous) should be 3 cc or less.
- The maximum amount that should be given subcutaneously in one site is 2 cc.
- The maximum amount that should be given in one site intramuscularly is 3 cc.
- If the amount to be given is less than 1 cc, accuracy can be increased by using a 1 cc syringe.

  The 1 cc and the 3 cc syringe are the most common sizes for injection.

A common method of injection used today involves the cartridge syringe. At this time, several manufacturers produce cartridge syringes. For this reason, you should become familiar with using this form of injection. Most importantly, when using this method, you should take steps to insure that the medication cartridge is securely held in the syringe. Most cartridge methods use a process in which the cartridge screws firmly in place. Also, you should insert the cartridge in a manner allowing the name of the medication and the calibrations to be easily read.

Intramuscular Injections

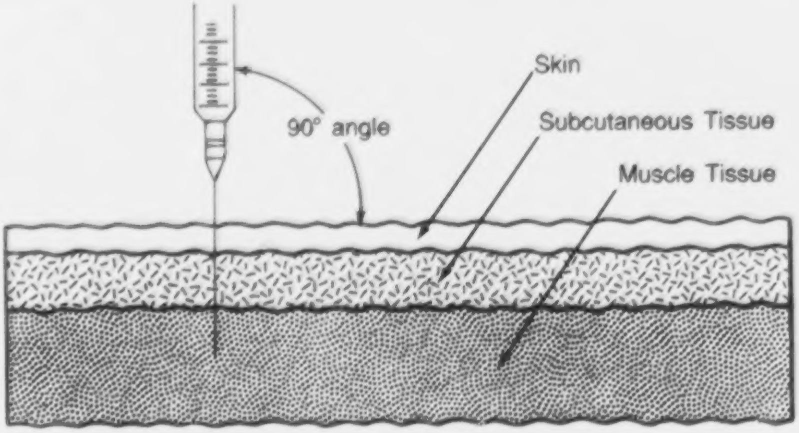
Most people in America today have experienced intramuscular injections, because immunizations are given routinely in this manner. Intramuscular injections are a frequent method of administering medication. This route provides a moderate absorption speed for small amounts of liquid medication.

There are several sites to choose from that have been described previously. Patient needs and aspects of the medications must be considered prior to giving any medication by this route.

To administer intramuscular medication, follow the guidelines below.

- Use a needle that is 1-2 inches in length with a gauge of 21-25. This choice is determined by the patient, the site being used, and the medication.
- Hold the skin taut (spread out tightly).
- Give the injection at a 90° angle to the plane of the site.

Intramuscular



- You should aspirate or pull back on the plunger slightly to check for blood. Normally, only small air bubbles will appear, but, if blood appears, discontinue the injection at that point.

- Use light massage, as well as patient activity, to help increase the absorption of the medication.

Z-Tract method

The z-tract method is an alternate method for injection of intramuscular medication. You should use this method with medications that are irritating or stain the skin. The z-tract is also useful for patients with severe edema or skin that does not seal well around injection sites, causing the medication to leak out of the site.

The difference in using this method occurs in the handling of the site. To administer medications by the z-tract method, follow the guidelines below.

- When using z-tract, you push the skin away from the site before injection and do not release it until after the needle is removed.
- Wait about 10 seconds between finishing the injection and withdrawing the needle.
- This method allows the skin to move over the injection site, creating a seal.
- If sufficient tissue is present, use a longer needle to inject the medication deeper into the muscle.

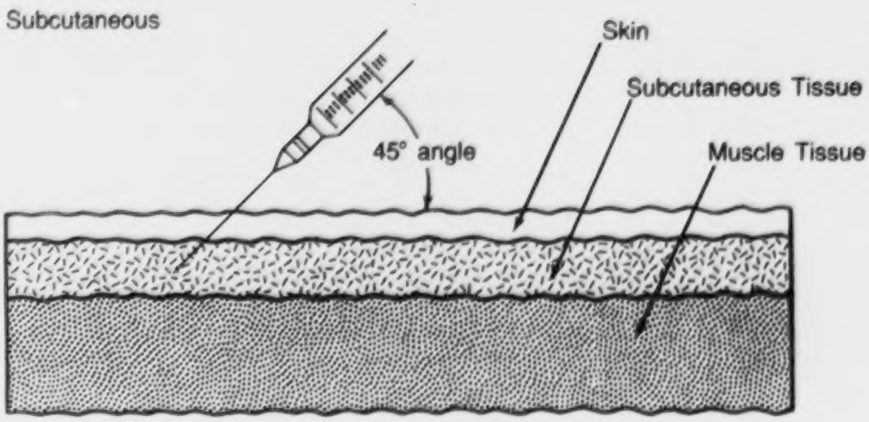
Subcutaneous Injections

Subcutaneous injections are a common route of injection. These injections deliver the drug to the subcutaneous tissue where it is slowly absorbed into the circulatory system. The following procedure will provide you with the general steps in the administration of subcutaneous injections.

To administer subcutaneous injections, follow the guidelines below.

- Check for the five rights and verify the medication three times while drawing the medication.
- The total amount of a subcutaneous injection should not exceed 2 cc for an adult.
- The needle gauge ranges from 25 - 27 with lengths from 3/8 - 5/8 inch.

- Pinch the skin together, and insert the needle with the bevel up at a 45° angle.



- Use aspiration to check for blood.

- If blood is found, remove the needle immediately, and begin the preparation of the injection again.

Subcutaneous (Insulin)

One of the most common medications administered by the subcutaneous route is insulin. Insulin is a hormone that acts to metabolize carbohydrates. Sources of insulin include: beef, pork, human, and synthetic. Several forms of insulin also exist. Care must be used to be certain that the correct source and type of insulin is being administered. On the following page is a chart of the most common insulins with the onset of action, peak time, duration or action, and appearance.

Rapid-acting insulin

Insulin Preparations

U-100

Rapid-acting	Onset of Action	Peak	Duration	Appearance
Regular	1/2 hr	2 1/2-5 hr	8 hr	Clear, colorless
Crystalline zinc	1/2-1 hr	2-4 hr	8 hr	Clear, colorless
Semilente	1 1/2 hr	5-10 hr	16 hr	Cloudy
Humulin R	15 min	1 hr	6-8 hr	Clear, colorless
Mixtard	1/2 hr	4-8 hr	24 hr	Cloudy
Velosulin	1/2 hr	1-3 hr	8 hr	Clear
Novolin	1/2 hr	2 1/2-5 hr	8 hr	Clear

Intermediate-acting and slow-acting insulin

Insulin Preparations

U-100

Intermediate-acting	Onset of Action	Peak	Duration	Appearance
NPH	1 1/2 hr	4-12 hr	24 hr	Cloudy
Lente	2 1/2 hr	7-15 hr	24 hr	Cloudy
Insulatard NPH	1 1/2 hr	4-12 hr	24 hr	Cloudy
Novolin L	2 1/2 hr	7-15 hr	24 hr	Cloudy
Novolin N	1 1/2 hr	4-12 hr	24 hr	Cloudy
Humulin N	1 hr	4 hr	24 hr	Cloudy
Slow-acting				
Ultralente	4 hr	10-30 hr	36 hr	Cloudy
PZI (protamine zinc insulin)	4-8 hr	14-20 hr	36 hr	Cloudy

Reproduced by permission. MEDICATIONS AND MATHEMATICS FOR THE NURSE 6/E By Jane Rice and Ester G. Skelly. Delmar Publishers, Inc., Copyright 1988.

Insulin varies in strength. The three strengths of insulin available include

U-100	This is the most commonly used strength of insulin. U-100 means there are 100 units of insulin per cc. The other two forms listed below are only used in special circumstances.
U-40	Patients who give their own insulin and have visual disorders may require U-40. This form uses a device that magnifies the barrel and calibrations of the syringe, making it easier for one to read.
U-500	Another form of insulin, which is used very rarely and only in extreme cases.

NOTE: When using each type of insulin, one should use syringes designed for that particular type of insulin. For example, U-100 syringes should only be used with U-100 insulin.

You must treat insulin with care.

- Insulin must be stored in a cool place, but not frozen.
- To mix the medication, roll it gently between your palms. Don't ever shake the bottle, as this destroys the insulin molecules and allows bubbles in the solution.
- Expiration occurs sooner for insulin than most medications. Therefore, check the date before administration.
- You should also be familiar enough with the particular insulin to recognize a change in appearance of the medication.

These precautions should be used in addition to the routine precautions of administering any subcutaneous medication. You must check the routine five rights and the most recent blood sugar according to your facility's policy. During administration, avoid massaging the site of the injection. The patient should be instructed to watch for signs of hypoglycemia. Additionally, you should be knowledgeable about diabetes mellitus, its effects, and the treatment for it.

Rotation schedule for insulin.

Insulin sites must be rotated to prevent destruction of subcutaneous fat in areas due to frequent injection of insulin. It is necessary to provide patient instruction for home use of a rotation schedule as well as utilizing careful documentation during hospitalization of diabetic patients. The following diagram illustrates subcutaneous sites available when rotating sites of injection of insulin.

Subcutaneous (Heparin)

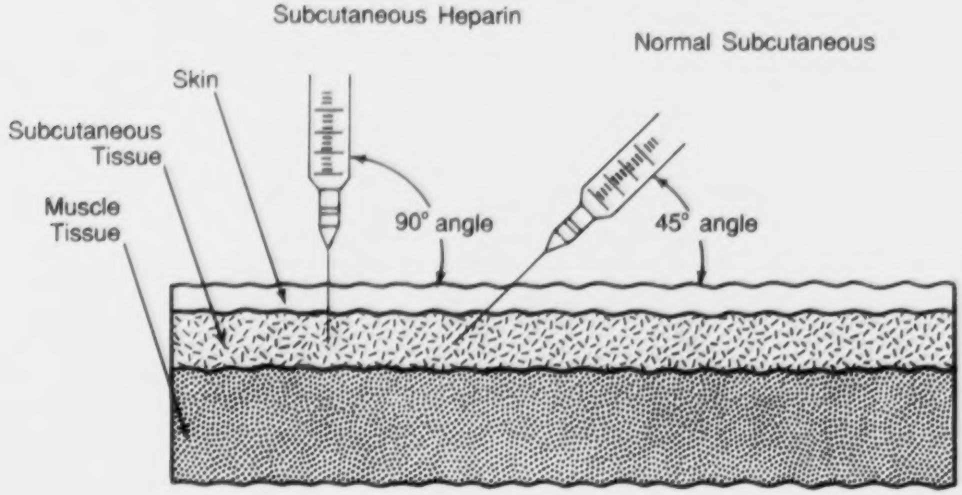
Subcutaneous heparin is used frequently for anticoagulant therapy. Heparin not only works systemically, but it may also have some localized anticoagulant side effects. For this reason, it is necessary to use special techniques and precautions when administering heparin by the subcutaneous route.

To administer subcutaneous heparin, follow the guidelines below.

- The site of choice for the injection is the fat pads of the iliac crest.

  NOTE: It may be necessary to use the other subcutaneous sites. Special care should be given to avoid areas which are being exposed to pressure or have insufficient tissue depth for the 90 degree injection.

- Use a 1 cc tuberculin syringe to accurately measure the medication.
- Make the injection with a small gauge needle, 26-27, which is approximately 1/2" in length.



- Unlike other subcutaneous injections, use a 90° angle.
- If a hematoma is present in the area, avoid injection into the hematoma.
- Gentle pressure following the injection controls local bleeding.
- Use a rotation schedule to administer heparin.
- Some facilities use ice packs before or after administration. You should become familiar with your facility's policy on this.

WARNING: Do not perform aspiration when administering heparin because this increases local tissue damage and the likelihood of hematoma formation.

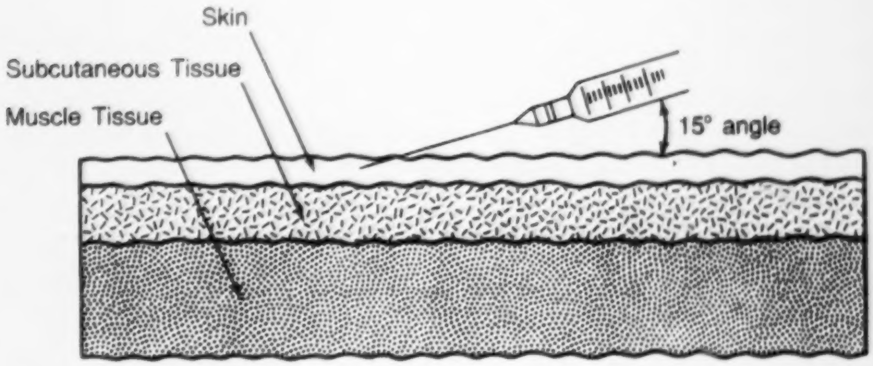
Intradermal Injections

Intradermal injections are generally used to test sensitivity to a substance. Tuberculin tests and skin allergy tests are the two most common uses of intradermal injections. In this method, the substance is inserted just below the epidermis and into the dermis.

To administer an intradermal injection, follow the guidelines below.

- It is important that you note the exact location of the test so that readings will be accurate.
- With these injections, the angle should be either 15° or 165°.

Intradermal



- With the bevel of the needle up, push the needle just under the skin.
- Apply a slight lift to the needle area and inject the medication, forming a small bleb.

OBJECTIVE 9 **Identify methods used when administering medications to a young child or infant.**

In general, the computation of dosages for children of various ages is the responsibility of the physician. Only the experienced practical nurse should proceed without supervision in giving medications to infants. Experience is necessary because some children's doses are deceptively large, but correct, while others may appear reasonable to the unpracticed eye, but are incorrect. The majority of errors in giving medications to children involves the individual transcribing the doctor's order onto the medicine card incorrectly or is caused when the individual reads the order incorrectly when giving the medication.

EXAMPLE: Order - Give digoxin elixir 0.05 mg. bid
Given - digoxin elixir 0.5 mg.

As you can see, this order was incorrectly read. In pediatrics, there is no room for juggling the decimal points!

The mechanics of giving medications to children is similar to that of adults.

1. Identify the patient. There is only one way to identify a young child or infant. READ THE NAME BAND.

   Twelve-year-old Jack, who is feeling foxy, will tell you that his name is George Jones - and take the medicine - just as a prank.

2. Assess the patient. If the patient is an infant

   - Do not use a medicine glass to give an infant medications. Some infants may prefer to suck the medication from a regular nipple as though they were feeding, or you may use a medicine dropper.
   - Elevate the infant's head, and give only a few drops at a time, making sure it is swallowed. If infant spits the medication, report this fact to the head nurse.

- DO NOT LEAVE INFANTS ON THEIR BACKS AT ANY TIME!
- NEVER HOLD AN INFANT'S NOSE TO FORCE SWALLOWING!

If the patient is a small child who is cup feeding

- Help the child maintain control over the cup to avoid spilling the medication

For young children and infants alike

- All tablets must be crushed. They may be sweetened with syrup diluted with water. Beware of diluting the medication too much, because it may be difficult to persuade the youngster to swallow the entire amount.
- Check the youngster's mouth to verify the medication has been swallowed.
- Report spitting or vomiting. Older children can usually manage pills and capsules fairly well; however, always ask if they have trouble with gagging or choking on tablets prior to giving them one to swallow.

General rules for administering medications to children

- Measuring Dosages—Do not attempt to measure dosages such as 1/2 teaspoon in a teaspoon or in a dram glass. These measurements may be dangerously inadequate. Measure this amount in a 3 cc syringe. If a teaspoon is equal to 5 cc, it will be very easy for you to measure 2 1/2 cc (1/2 tsp.) on the syringe. Then you can use the syringe, without a needle, as a dropper to drop the medication into the baby's mouth.
- Administering Small Dosages—When giving children dosages ordered in minims or less than 1 cc, always use a tuberculin syringe for administration. Because of the small markings on the 3 cc syringe, you may give an inaccurate dose of medication.
- Giving Medications to Small Children—Treat your patient as a respected individual. Praise or hold the child after receiving an injection. In some situations, such as giving injections in hospitals, you may not want to allow parents to be present during injection. Assess the role/relationship of the family before sending parents out.

- Selecting Needles to Be Used For Small Children—Because children's muscle layers are not as thick as an adult's, you will need to select shorter needles or be prepared to inject needles less deeply. When possible, use needles with smaller lumens to prevent undue pain.

- Using Needles to Give Small Children Medication—Children naturally object to "needles." Therefore, you may never enter a room and expect joyful anticipation. A combination of firmness and kindness will get the job done. To prevent sudden movement, you will need help. Explain to children that you are helping them "hold still." Administer the medication as quickly as safety permits so that the child's anticipation is kept to a minimum. Band-Aids are great healers!

- Injecting a Child—Never attempt an injection on a child without adequate help. Intramuscular injections should be given in the vastus lateralis for infants and young children since this is the largest muscle.

- Use of Restraints—Restraints (cloth) are generally not necessary if the proper techniques are used and adequate assistance is available.

Administering Nose Drops to Small Children—Nose drops are universally disliked by all children until they are old enough to understand their benefits. Therefore, you will probably need help when administering them.

- If the child's nose is congested, suction it before inserting the drops; suction is another procedure hated by children.

- Lie the child down with head tilted backwards.

- Administer the drops with the dropper pointed slightly upward.

- Keep the child in the horizontal position for a few minutes to allow the drops to work. Some children will cooperate by sniffing if asked.

- Don't use oily nose drops because of possible aspiration.

Administering Eardrops to Small Children—Eardrops should be at room temperature before inserting them, because, if cold, they will probably cause pain, nausea, and vomiting.

- Pull the child's ear down and back to straighten the external auditory canal—otherwise, the drops will not go in properly.

- Do not use cotton ear plugs, unless specifically ordered.

Administering Eyedrops to Small Children—Always ask for assistance before attempting to give eyedrops to an anxious child. The child may move suddenly, causing you to damage the cornea with the dropper.

- Instill the eyedrops in the lower conjunctival sac, not on the eyeball.
- Ask children to look up toward the tops of their heads; this procedure will be helpful, if the child cooperates.
- Many infants squeeze their eyelids more and more tightly shut. For this reason, you may need sterile cotton balls to help open the eyelids, because those little eyes become very slippery and difficult to control.

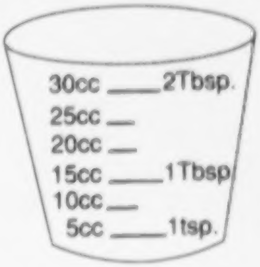
Applying Topical Ointments on Young Children—After applying topical ointments, little ones may try to eat whatever you have applied. For this reason you may need to cover the area where the ointment has been applied, restrain the part of the body containing the ointment, or make sure the ointment is not harmful if eaten.

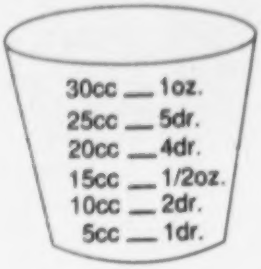
OBJECTIVE 10

Identify method used to read a medicine glass.

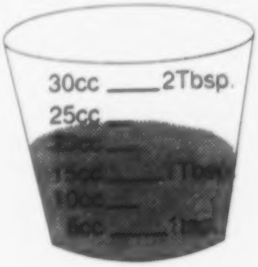
The dosage of a medication is one of the most important aspects. The nurse must be able to read the instruments of measurement correctly to be certain that the amount of medication given is the amount that was ordered. With liquid medications, the measurement device most commonly used is the medicine glass. These glasses may be plastic or glass. Most of these glasses are now labeled using all three systems of measurement: apothecary, household, and metric. This labeling decreases the need for conversion when calculating the dosage amount of a medication.

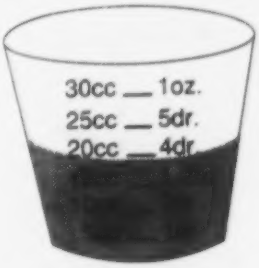
The following illustration shows the two sides of a medicine glass.


30cc 2Tbsp.
25cc
20cc
15cc 1Tbsp.
10cc
5cc 1tsp.


30cc 1oz.
25cc 5dr.
20cc 4dr.
15cc 1/2oz.
10cc 2dr.
5cc 1dr.

To read a medicine glass correctly, you must hold the glass at eye level and the bottom of the meniscus. A meniscus is the curve of the fluid within a container. Regardless of whether the meniscus is positive—bulges in the center or negative—dips in the center, use the lowest point for determining the amount in the glass.


30cc 2Tbsp.
25cc


30cc 1oz.
25cc 5dr.
20cc 4dr.

Hints for organization in administration of medication.

Become accustomed to doing your homework on medications. You must become familiar with the frequently used medications in order for you to complete your work more efficiently. However, this does not mean you will no longer have to look up information on medications while working; instead, a greater knowledge of medications will increase your efficiency in administering medications.

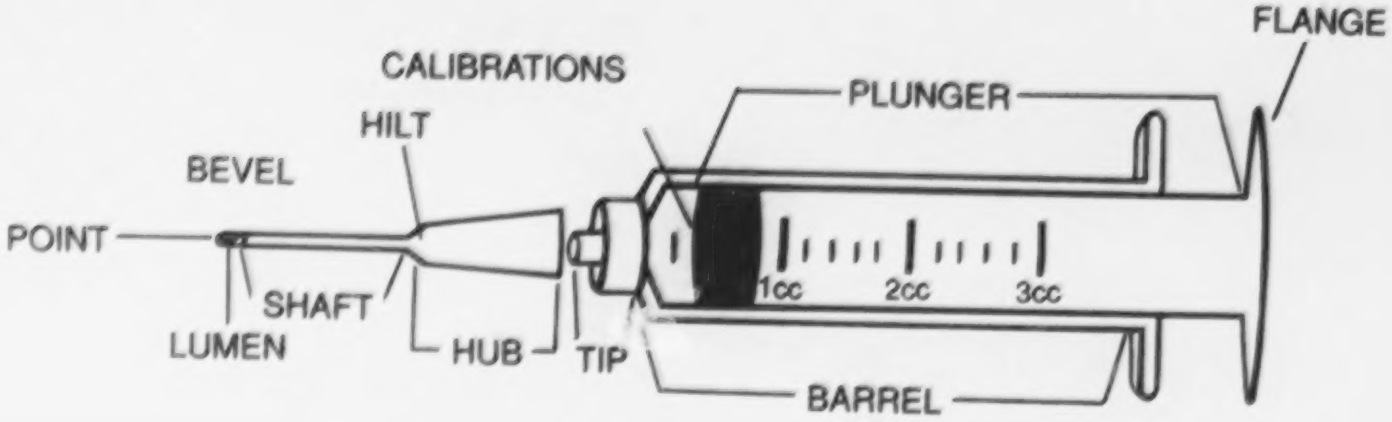
Plan ahead. As much as possible, use your free time to set up future medications. If medication carts with individual patient drawers are used in a unit dose system, several options are available:

- Calculate dosages ahead of time, and double check them. This also provides more time for the charge nurse to check the dosages.
- Set up medication in cup, and label the cup with the room number and the time to be given. Double check the dosage before taking it to the patient's room.
- Wrap tape around syringes, and write the room numbers on the tape, which acts as a label. When preparing ahead, be careful not to mix medications for injection.
- Make a schedule of expected medication times. Some facilities have sheets for this purpose. Scheduling may save time; however, it is still necessary to check the medication sheets immediately prior to giving medications to see if any changes have been made.

Make routine patient visits to assess the need for prn medications. Some medications, especially pain medications, do not necessarily require a patient initiated request; instead, the need for such medications may be based on an ongoing assessment of the patient, as well as your knowledge that severe pain requires more medications and more time to obtain relief.

Make checking the five rights and verifying medications a habit. Always pay close attention to detail. Habits are faster and more efficient than using various approaches.

NEEDLE SYRINGE


FLANGE
CALIBRATIONS
PLUNGER
HILT
BEVEL
POINT
1cc
2cc
3cc
SHAFT
LUMEN
HUB
TIP
BARREL

Transparency Master 1 - PN - Pharmacology
IV - 69

ASSIGNMENT SHEET 1

ADMINISTER MEDICATIONS

IV

OBJECTIVE 11

Communicate appropriately during administration of medication.

NAME ______________________________ SCORE ________

INTRODUCTION

Good communication is always a helpful tool in nursing. During the process of administering medications the patient is highly sensitive to the practical nurse. Too much stress at this time can decrease the effects of your patient teaching; however, good communication skills can overcome stress and provide for patient education.

This is an ideal time to provide patient teaching about medication. The communication can focus on the medications and the patient's understanding of them. The nurse can use this time to have the patient demonstrate information that has previously been discussed or demonstrated to the patient. Regardless of the level of the patient this time is valuable for assessing the patients knowledge and response to medication.

This assignment is to provide circumstances for appropriate communication. This may necessitate initiation of communication or appropriate response to patient initiated communication.

DIRECTIONS

After each situation listed below, write the statement or questions that you think would best meet the needs of the patient in that particular situation.

1. Mrs. Bixby is new on the unit with a diagnosis of abdominal pain. She arrived at 3:00 a.m. and has orders for NPH insulin 28 units this a.m. If the medication history has not been completed, what should be the first topic discussed with this patient immediately prior to giving this injection?

   ____

   ____

   ____

   ____

2. Mr. Travis is scheduled for exploratory surgery tomorrow. The doctor has ordered a clear liquid diet and Go-Lytely 1 gallon this p.m. Mr. Travis has cooperated on the first two glasses but then asks, "Why do I have to have so much of this stuff?" What would you say in response?

____

____

____

____

3. A patient has been discharged on the antibiotic that she has been receiving for three days. She tells you "I don't need to take these at home, do I?" What would your response be?

____

____

____

____

4. Mrs. Harper has been in the hospital several times for angina. She is on Lasix and on Digoxin. When you take her medication to her she tells you, "those two little white pills sure are good. Those are my water pill and my heart pill." What response could increase your knowledge of this patient's understanding of her medication?

____

____

____

____

5. Mr. Compton is aphasic following a CVA. His wife stays with him at all times. He has vomited several times during this shift. The physician has ordered Compazine suppositories. Mrs. Compton asks if you would show her how to give the suppository to her husband. How would you respond to this?

____

____

____

ASSIGNMENT SHEET 2

ADMINISTER MEDICATIONS

IV

OBJECTIVE 12

Read a medicine glass.

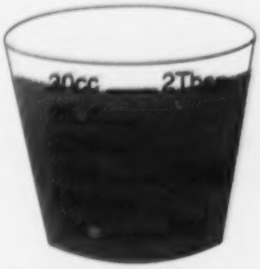
NAME ______________________ SCORE ______

DIRECTIONS

To become more proficient in reading medicine glasses, this assignment sheet provides pictures of medications in glasses, which you are to read.

State the amount contained in each medicine glass in the system(s) given.

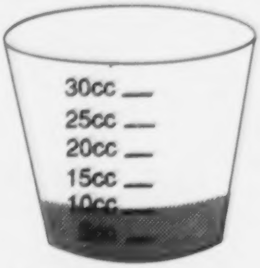
1.



A. Metric ____________

B. Household ________

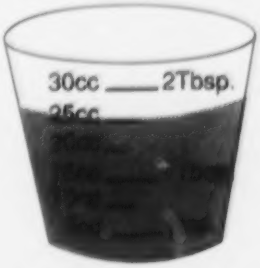
2.


30cc
25cc
20cc
15cc
10cc
5cc

A. Metric ____________

B. Household ________

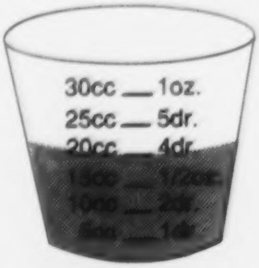
3.


30cc
2Tbsp.
25cc
20cc
15cc
1Tbsp.
10cc
5cc

A. Metric ____________

B. Household ________

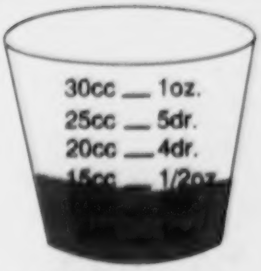
4.


30cc
1oz.
25cc
5dr.
20cc
4dr.
15cc
1/2oz.
10cc
2dr.
5cc
1dr.

A. Metric ____________

B. Apothecary ________

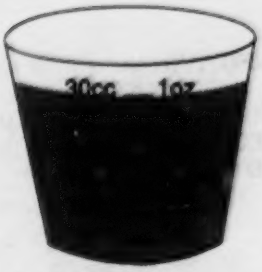
5.


30cc — 1oz.
25cc — 5dr.
20cc — 4dr.
15cc — 1/2oz.

A. Metric ____________

B. Apothecary ________

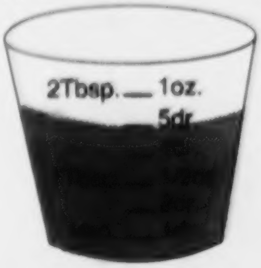
6.



A. Metric ____________

B. Apothecary ________

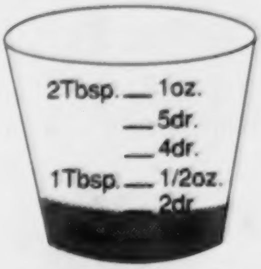
7.


2Tbsp. — 1oz.
5dr.

A. Apothecary ________

B. Household ________

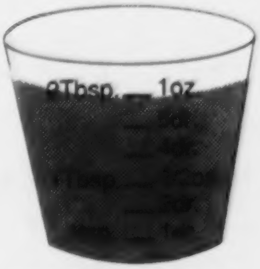
8.


2Tbsp. — 1oz.
— 5dr.
— 4dr.
1Tbsp. — 1/2oz.
— 2dr.

A. Apothecary ________

B. Household ________

9.



A. Apothecary ________

B. Household ________

ASSIGNMENT SHEET 1

Answers should include the following:

Important aspects

1. How long has this person been on insulin? If not first, does the patient do self injection? Is there a change in any previous or home order of insulin?
2. Patient needs explanation of the need for thorough bowel evacuation prior to abdominal surgery.
3. Need to stress the importance of maintaining blood level of antibiotic to prevent recurrence of infection.
4. May ask which tablet is which. Check for side effects of either drug. Check for patients knowledge of need for potassium.
5. Know facility policy. It would generally be best to provide the wife with teaching in how to administer the suppository. The first time use demonstration with explanation, then have wife perform second with observation from nurse.

ASSIGNMENT SHEET 2

1. a. 30 cc
   b. 2 Tbs
2. a. 10 cc
   b. 2 tsp
3. a. 25 cc
   b. 5 tsp or 1 2/3 Tbsp
4. a. 20 cc
   b. 4 dr
5. a. 15 cc
   b. 3 dr or 1/2 oz
6. a. 30 cc
   b. 1 oz.
7. a. 4 dr
   b. 4 tsp or 1 1/3 Tbsp
8. a. 2 dr
   b. 2 tsp
9. a. 2 Tbsp
   b. 1 oz.

JOB SHEET 1

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13 a

Prepare an injection from a single or multi-dose vial.

EQUIPMENT AND SUPPLIES

- Syringe with attached needle
- Vial
- Medication order
- Medication card/sheet
- Alcohol swabs
- Medication tray
- Medication cart

PROCEDURE

Assessment and Analysis

1. Verify medication order.
    a. read physician's order.
    b. read the medication card/sheet.
2. Review the literature specific to the medication.
3. Determine the correct dosage.
4. Determine the size of syringe needed.

Planning

5. Wash hands.
6. Select and organize the equipment.
7. Keep medication card or sheet in position for easy reading.
8. Obtain medication vial.

Implementation

9. Compare name of medication with medication card/sheet.

10. Check expiration date on the medication, and determine if medication is usable according to facility policy.

11. Remove protective covering from vial if present.

12. Cleanse rubber stopper with alcohol swab.

13. Remove syringe from packaging handling only barrel, flange of plunger and needle cap.

14. Push plunger completely up within the barrel.

15. Pull plunger back to the desired dosage amount.

16. Remove the needle cap.

17. Insert needle into the center of the vial avoiding any previous puncture sites.

18. Inject air from syringe into air space of vial.

19. Read for correct name. Invert vial with label toward nurse.

20. Position needle lumen beneath the level of the fluid.

21. Withdraw correct amount of medication.

22. Remove air during preparation using appropriate method.

23. Remove needle from vial.

24. Place cap on needle.

25. Read label for correct medication.

26. Return medication to storage area if multi-dose vial or dispose if single-dose vial.

27. Place injection on medication tray.

JOB SHEET 2

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13 b

Prepare an injection from an ampule.

EQUIPMENT SUPPLIES

- Syringe
- Filter needle
- Needle of appropriate size and gauge for injection
- Medication order
- Medication card/sheet
- Alcohol swab or gauze pad
- Medication tray
- Medication cart
- Ampule

PROCEDURE

Assessment and Analysis

1. Verify medication order.
    a. read physician's order.
    b. read medication card/sheet.
2. Determine correct dosage.
3. Determine the size of syringe needed.
4. Verify that medication is not out-dated.

Planning

5. Wash hands.
6. Select and organize equipment.
7. Obtain medication ampule.
8. Keep medication card or sheet in position for easy reading.

Implementation

9. Compare name of medication with medication card/sheet.
10. Have all medication in base of ampule.
11. File neck of ampule (optional step)
12. Place alcohol swab or gauze pad around neck of ampule.
13. Apply solid pressure to top of ampule to break.

    WARNING: Avoid breaking toward the face to prevent medication and glass in eyes.

14. Place ampule on surface and discard of top.
15. Place filter needle on syringe.
16. Insert filter needle into ampule.
17. Invert ampule.
18. Withdraw medication from ampule.
19. Keep needle below the level of the fluid medication.
20. Compare label with order for right medication.
21. Remove filter needle from ampule.
22. Recheck label and discard ampule appropriately.
23. Discard filter needle appropriately.
24. Replace filter needle with desired needle.
25. Push medication to desired dose or until medication appears at tip of needle.
26. Cap needle and place on medication tray.
27. Wash hands.

JOB SHEET 3

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13 c

Administer sublingual medication.

EQUIPMENT AND MATERIALS

- Sublingual tablet
- Medicine cup
- Medication order with sublingual medication ordered
- Medication card/sheet
- Pen
- Patient or mannikin
- Medication cart or cabinet
- Unsterile glove

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Verify medication order for sublingual medication.
    a. read doctor's order sheet.
    b. read medication card/sheet.
3. Check the 5 rights of medication administration.
    a. check the patient name.
    b. check the name of the medication.
    c. check the dosage of the medication.
    d. check the route of medication.
    e. check the date and time for the medication.
4. Review the literature on specific medication.

5. Determine what equipment will be needed and determine correct dosage.

Planning

6. Wash hands.

7. Gather equipment.

Implementation

8. Read name of medication to be given from the record.

9. Check label when taken from shelf or drawer.

10. Check label when pouring medication.

11. Remove correct amount of medication:

    a. tablet

        (1) pour [illegible] bottle into bottle cap unit you have correct dosage.

        (2) transfer to the medicine cup unless prepackaged.

    b. unit - dose medication

        (1) place package containing medication in medicine cup.

12. Check label when returning to shelf or drawer.

13. Place medication on tray or cart.

14. Place patient medication card with medication. (Optional Step)

15. Identify patient prior to giving medication.

    a. read identification band.

    b. verbalize or ask name for verification.

16. Instruct patient of medication.

    a. state purpose of medication.

    b. state correct placement of medication.

    c. check for patient questions.

17. Place sublingual medication under tongue using glove or have patient place under tongue and observe.

    NOTE: Stay with patient until tablet has dissolved. Do not give water!

18. Watch patient to be sure medication is not swallowed.

19. Leave patient in comfortable position.

20. Discard medication cup as appropriate.

21. Wash hands.

Evaluation

22. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects. If nitroglycerin, remain 5 minutes, or until relief is obtained.

Documentation

23. Record accurately according to the policies of the facility.

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 4

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13d

Administer buccal medication.

EQUIPMENT AND MATERIALS

- Buccal tablet
- Medicine cup
- Medication order with buccal medication order
- Medication card/sheet
- Medication cart or cabinet
- Unsterile glove

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Verify medication order for buccal medication.
    a. read doctor's order sheet.
    b. read medication card/sheet
3. Review information regarding the medication.
    a. check the patient name.
    b. check the name of the medication
    c. check the dosage of the medication
    d. check the route of medication.
    e. check the date and time for the medication.
4. Determine what equipment will be needed and safe dosage.

Planning

5. Wash hands.
6. Gather equipment.

Implementation

7. Read name of medication to be given from the record.

8. Check when taken from shelf or drawer.

9. Check when pouring medication.

10. Remove correct amount of medication:

    a. tablet

        (1) Pour from bottle into bottle cap unit you have correct dosage.

        (2) Transfer to the medicine cup unless prepackaged.

    b. Unit—dose medication

        (1) Place package containing medication in medicine cup.

11. Check when returning to shelf or drawer.

12. Place medication on tray or cart.

13. Place patient medication card with medication. (Optional Step)

14. Identify patient prior to giving medication.

    a. read identification band.

    b. verbalize or ask name for verification.

15. Instruct patient of medication.

    a. state purpose of medication.

    b. state correct placement of medication.

    c. check for patient questions.

16. Place buccal medication between cheek and gum using glove or have patient place between cheek and gum and observe.

17. Watch patient to be sure medication is not swallowed.

18. Leave patient in comfortable position.

19. Discard medication cup as appropriate.

20. Wash hands.

Evaluation

21. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

22. Record accurately according to the policies of the facility.

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 5

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13 e

Apply topical medication.

EQUIPMENT AND MATERIALS

- Topical medication
- Dressing as appropriate
- Medication order with topical medication order
- Medication card/sheet
- Pen
- Patient or mannikin
- Medication cart or cabinet
- Gloves (minimum 3) - sterile or unsterile as needed

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Verify medication order for topical medication.
   a. read doctor's order sheet.
   b. read medication card/sheet.
3. Review information regarding the medications.
4. Check the 5 rights of medication administration.
   a. check the patient name.
   b. check the name of the medication.
   c. check the dosage of the medication.
   d. check the route and location for medication.
   e. check the date and time for the medication.
5. Check for clarification of method of application, if needed.

6. Review the literature for the specific medication.
7. Determine equipment you will need and method of safe administration.
8. Determine correct amount of medication.

Planning

9. Wash hands
10. Gather equipment

Implementation

11. Verify medication 3 times during preparation.
    a. check when taken from shelf or drawer.
    b. check when preparing medication.
    c. check when returning to shelf or drawer.
12. Identify patient prior to giving medication.
    a. read identification band.
    b. verbalize or ask name for verification.
13. Instruct patient of medication.
    a. state purpose of medication.
    b. state correct placement of medication.
    c. state care of site after application.
    d. check for patient questions.
14. Provide privacy.
15. Apply glove.
16. Remove old medication.
17. Apply clean gloves.
18. Apply topical medication as specified by orders.
19. Apply dressing as specified.

20. **Wash hands.**

Evaluation

21. **Evaluate according to the five rights, and if appropriate to the drug, return in 30 minutes to check for desired effect and side effects.**

Documentation

22. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

23. Document instruction.

24. Document administration of medication.

25. Document effects of medication.

JOB SHEET 6

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13f **Administer eye medication.**

EQUIPMENT

- Eye drops/ointment
- Paper tissues and/or sterile cotton balls
- Eye dressing, if needed
- Normal saline solution
- Medication order
- Medication record

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to an individual patient.
2. Check medications listed against physician's orders.
3. Review information regarding the medications.
4. Determine accurate dosage and methods for safe administration.

Planning

5. Determine what equipment you will need.
6. Wash your hands.
7. Gather equipment.

Implementation

8. Read name of medication to be given from record.
9. Check label on medication and take from shelf or drawer.
10. Check label again.
11. Determine dropper is functional and accurate for amount needed.

12. Check label a third time.

13. Place medication on tray or cart.

14. Place patient medication card with medication. (Optional Step)

15. Approach and identify patient.

16. Explain what you are going to do and any specific related to drug.

17. Wash your hands.

18. Tilt head back and support on pillow.

19. Instruct patient to look up.

20. Observe condition of the eye.

21. Remove exudate with saline moistened cotton ball wiping from inner canthus to outer canthus.

    NOTE: Use separate cotton ball for each wipe.

22. Expose the lower conjunctival sac.

23. Apply medication.

    WARNING: Never touch the eye or face with dropper or ointment tip.

    Solution

    a. have patient look upward

    b. drop specified number of drops into conjunctival sac.

    c. apply gentle pressure with tissue to inner canthus

    NOTE: Wait 1 to 5 minutes between different medications.

    Ointment

    a. apply thin line of ointment along lower conjunctival sac.

    b. instruct patient to close eyelids and roll eyes back and forth and up and down to spread ointment.

24. Leave patient in comfortable position.

25. Discard medication container as appropriate.

Evaluation

26. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

27. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 7 — ADMINISTER MEDICATIONS — IV

OBJECTIVE 13 g — **Administer ear medications.**

EQUIPMENT

- Otic solution with dropper
- Cotton ball
- Medication order
- Medication record

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to an individual patient.
2. Check medications listed against physician's orders.
3. Review information regarding the medications.
4. Determine what equipment you will need and accurate dosage.

Planning

5. Wash your hands.
6. Gather equipment.

Implementation

7. Read name of medication to be given from record.
8. Check label on medication and take from shelf or drawer.
9. Check label again.
10. Determine that dropper works.
11. Check label a third time.
12. Place medication on tray or cart.
13. Place patient medication card with medication. (Optional Step)
14. Approach and identify patient.

15. Explain what you are going to do and any specific related to drug.

16. Check ear canal for excess wax.

17. Obtain order for irrigation if canal blocked by wax.

18. Position affected ear up.

19. Pull earlobe correctly for age of patient.

20. Drop medication into ear canal without touching ear or face with dropper.

21. Insert cotton ball if ordered.

22. Instruct patient to keep ear up for several minutes.

23. Leave patient in comfortable position.

24. Discard medication container as appropriate.

25. Wash your hands.

Evaluation

26. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

27. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 8

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13 h **Administer nasal medication.**

EQUIPMENT

- Nasal drops or spray
- Tissues
- Medication order
- Medication record

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to an individual patient.
2. Check medications listed against physician's orders.
3. Review information regarding the medications.
4. Determine what equipment you will need and accurate dosage.

Planning

5. Wash your hands.
6. Gather equipment.

Implementation

7. Read name of medication to be given from record.
8. Check label on medication and take from shelf or drawer.
9. Check label again.
10. Determine correct amount of medication is available.
11. Check label a third time.
12. Place medication on tray or cart.
13. Place patient medication card with medication. (Optional Step)
14. Approach and identify patient.

15. Explain what you are going to do and any specific related to drug.

16. Instruct patient to gently blow nose.

17. Administer the medication.

    Drops:

    a. tilt head far back.

    b. instill ordered drops into nostril(s)

    c. instruct patient to keep head back for 2 to 3 minutes

    Spray:

    a. shake spray bottle and hold erect

    b. position head erect

    c. block one nostril

    d. instruct patient to breath slowly through unblocked nostril during puff

    e. instill puff or spray

18. Have tissues available, but instruct patient to avoid blowing nose.

19. Leave patient in comfortable position.

20. Discard medication container as appropriate.

21. Wash your hands.

Evaluation

22. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

23. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 9

ADMINISTER MEDICATIONS

OBJECTIVE 13

Administer oral medications.

EQUIPMENT AND SUPPLIES

- Oral medication(s)
- Medicine cups
- Medication order
- Medication card/sheet
- Medication cart
- Medication tray
- Patient or mannikin
- Pen

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Check medications listed against physician's orders.
3. Review information regarding the medications.
4. Assess patient's ability to swallow medications.
5. Assess patient for need for prn medications.
6. Determine what equipment you will need and accurate dosage.

Planning

7. Wash your hands.
8. Gather equipment.

Implementation

9. Read name of medication to be given from record.
10. Check label on medication and take from shelf or drawer.

11. Check label again, before pouring.

12. Remove correct amount of medication.

    a. tablet or capsule

        (1) pour from bottle into bottle cap until you have correct dosage.

        (2) transfer to the medicine cup unless prepackaged.

    b. liquid

        (1) remove bottle cap and place it upside down on the countertop.

        (2) holding cup at eye level, pour liquid to desired level.

        (3) pour with label facing up.

        (4) wipe neck of bottle before replacing cap.

    c. unit dosage

        (1) place package containing medication in medicine cup.

13. Return bottle to shelf or drawer, checking label a third time.

14. Place medication on tray or cart.

15. Place patient medication card with medication. (Optional Step)

16. Approach and identify patient.

17. Explain what you are going to do and any specific related to drug. State medication is to be swallowed.

18. Give patient a glass of water.

19. Observe patient to be sure medication is swallowed.

20. Leave patient in comfortable position.

21. Discard medication container as appropriate.

22. Wash your hands.

Evaluation

23. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

24. Record accurately according tot he policy of the facility. Include

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 10

ADMINISTER MEDICATIONS

OBJECTIVE 13j

Crush medications for administration.

EQUIPMENT AND SUPPLIES

- Pill crusher or mortar and pestle
- Tablet to be crushed
- Souffle cup
- Medicine cup

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Check the medications listed against the physician's orders.
3. Review the literature or check with the pharmacist about crushing specific medications.
4. Assess the patient for the need for crushed medications.
5. Determine accurate dosage.
6. Determine equipment needed.
7. Determine the individual needs and preferences of each patient.

Planning

8. Wash hands.
9. Obtain tablet to be crushed.
10. Organize equipment needed.

Implementation

11. Pour tablet into lid of container then place in souffle cup or medicine cup.
12. Place tablet in crushing device.
    a. place tablet in souffle cup into pill crusher OR

    b. place tablet into mortar.

13. Apply pressure for crushing.
    a. bring down handle of pill crusher.
    b. bring down and hammer pill with pestle.

Evaluation

14. Observe medication for completed crushing. Repeat step 13 as needed.
15. Pour medication into final medicine cup.
16. Cleanse device for crushing
17. Wash hands.

JOB SHEET 11

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13 k

Administer medication by nasogastric tube.

EQUIPMENT AND SUPPLIES

- Glass of room temperature water
- 5 - 10 ml syringe (adult) or 1 ml for young child
- Stethoscope
- Medication - liquid form
- Bulb or asepto syringe with catheter tip
- Patient
- Nasogastric tube
- Perineal pad

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Check the medications listed against the physician's orders.
3. Review the literature for information specific to the medication.
4. Assess the patency and placement of nasogastric tube just prior to administering any medications.
5. Read any notations on the chart about previous feedings.
6. Determine if medication can safely and effectively be given through the size nasogastric tube in place.
7. Determine if the effectiveness of the medication is altered by diluting or crushing.
8. Determine the safest patient position for administering medications via the nasogastric tube (this will vary with patient condition).
9. Determine required interventions for maintaining patency of the tube.

Planning

10. Wash hands.

11. Gather and organize needed equipment.

12. Obtain the correct medication.

Implementation

13. Identify patient.

14. Instruct patient of medication.

    a. state purpose of medication.

    b. state that medication will be given through N/G.

    c. check for patient questions.

15. Assemble equipment at bedside.

    a. place perineal pad under N/G connection site.

    b. provide water for flushing of tube.

    c. place asepto or bulb syringe on overbed table.

    d. place small syringe on overbed table.

    e. have stethoscope available.

    f. have medication on overbed table.

16. **WARNING:** Position patient upright, if condition allows.

17. Check placement of nasogastric tube.

    a. aspirate stomach contents.

    b. place stethoscope over stomach and listen as air is inserted for gurgling sound. (Preferred method)

    c. place unclamped N/G next to ear to listen for crackling noise

    d. place end of N/G in water watch for bubbling with respirations

18. Clamp tubing and attach asepto or bulb syringe.

19. Pour water into syringe with tubing clamped.

20. Unclamp and allow to run by gravity.

21. Observe for signs of aspiration.

22. Clamp tubing and pour medication into syringe.

23. Unclamp tubing and allow to run by gravity.

24. Repeat steps 23 and 24 for each medication.

25. Clamp tubing and pour water into syringe.

26. Unclamp tubing and allow to run by gravity.

or

27. Clamp tubing and reconnect to continuous feeding.

28. Reposition patient with head turned to one side.

29. Wash hands.

Evaluation

31. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

32. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 12 | ADMINISTER MEDICATIONS | IV

OBJECTIVE 131

Administer subcutaneous injections.

EQUIPMENT AND SUPPLIES

- Alcohol swabs
- Syringe (1-3 ml)
- 3/8", 1/2", and 5/8" needles with gauges 25-27
- Patient or mannikin with injectable areas
- Medication order
- Medication card/sheet
- Injectable subcutaneous medications

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Check medications listed against physician's orders.

   NOTE: If medication card/sheet reads correctly, continue with procedures: if not, make out new, correct card/sheet.
3. Review information regarding the medications.
4. Assess size and general build of patient.
5. Assess need for assistance.
6. Determine appropriate needle and syringe to be used.

Planning

7. Wash your hands.
8. Gather equipment.
   a. Obtain medication ordered.
   b. choose appropriate syringe.
   c. choose appropriate needle.

363

   d. connect syringe and needle.

   e. Obtain alcohol swabs.

   f. have correct medication card/sheet on working area.

Implementation

9. Read name of medication to be given from record.
10. Check label on medication and take from shelf, drawer, or refrigerator.
11. Check label again, before drawing.
12. Draw up ordered medication (Refer to Job Sheets 1 and 2)
13. Re-examine vial or ampule to check the label a third time and recalculate the dosage.
14. Place syringe, needle, and alcohol swab on tray.
15. Place patient medication card with medication. (Optional Step)
16. Approach and identify patient.
17. Explain to the patient and verify appropriate site.
18. Provide privacy.
19. Choose site for injection.
    a. pinch skin around site.
    b. cleanse site with alcohol swab.
    c. uncap needle.
    d. with bevel up (toward head) inject needle quickly into site at 45° angle.
    e. aspirate a small amount.

    WARNING: Air is expected, if blood appears remove needle immediately.

    f. inject total amount of medication.
    g. withdraw needle from area.

h. gently message site.

i. immediately dispose of needle and syringe into puncture proof container.

WARNING: Do not recap needle!

j. wash hands.

20. Leave patient in a comfortable position.

21. Wash your hands.

Evaluation

22. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

23. Record accurately according tot he policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

    f. If unusual circumstances exists, document differences in nurses notes.

JOB SHEET 13 — ADMINISTER MEDICATIONS — IV

OBJECTIVE 13 m

Administer subcutaneous insulin.

EQUIPMENT AND SUPPLIES

- Alcohol swabs
- Insulin syringes U-100 with needles attached
- 3/8", 1/2", and 5/8" needles with gauges 25-27
- Patient or mannikin with injectable areas
- Medication order
- Medication card/sheet
- Insulin for order

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Check medications listed against physician's orders.

NOTE: Check the most recent blood sugar. If below 100 mg, check policy for action - if below 70, give form of glucose according to policy.

3. Review information regarding the medications.
4. Assess size and general build of patient.
5. Check the chart to determine previous site of injection.
6. Assess need for assistance.
7. Determine appropriate needle and syringe to be used.

Planning

8. Wash hands.
9. Gather equipment.
    a. obtain medication ordered.

   b. choose appropriate syringe.

   c. choose appropriate needle.

   d. connect syringe and needle.

   e. obtain alcohol swabs.

   f. have correct medication card/sheet on working area.

Implementation

10. Read complete name of medication to be given from record.

11. Check label on medication and take from shelf or drawer.

12. Check label again, before calculating and preparing dosage.

13. Draw up correct dosage of medication in units.

    a. check expiration date of vial.

    b. gently rotate vial between palms.

    c. draw medication from vial; make sure you have exact volume needed.

    d. have another licensed nurse verify type, dosage and expiration date.

    e. recheck name of medication prior to storage.

    f. replace medication into refrigerated area.

14. Place syringe, needle, and alcohol swab on tray.

15. Place patient medication card with medication. (Optional Step)

16. Approach and identify patient.

17. Explain to the patient and verify appropriate site.

18. Instruct patient to watch for hypoglycemia.

19. Provide privacy.

20. Choose site for injection

    a. pinch skin around site.

b. cleanse site with alcohol swab.

c. uncap needle.

d. with bevel up (toward head) inject needle quickly into site at 45° angle.

e. aspirate a small amount.

WARNING: Air is expected. If blood appears, remove needle immediately.

f. inject total amount of medication.

g. withdraw needle from area.

h. pat site of injection, do not massage.

21. Immediately dispose of needle and syringe into puncture proof container.

WARNING: Do not recap needle!

22. Wash hands.

Evaluation

23. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

24. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 14

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13n

Administer subcutaneous heparin.

EQUIPMENT AND SUPPLIES

- Alcohol swabs
- 1 cc tuberculin syringes with 1/2" needles gauges 26-27
- Patient or mannikin with injectable areas
- Medication order
- Medication card/sheet
- Injectable subcutaneous medication—heparin

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.

   NOTE: Check most recent PT for range 1 1/2 - 2 1/2 times control level.

2. Check medications listed against physician's orders.
3. Review information regarding the medications.
4. Assess size and general build of patient.
5. Assess need for assistance.
6. Determine appropriate needle and syringe to be used.

Planning

7. Wash your hands.
8. Gather equipment.
   a. obtain medication ordered.
   b. choose appropriate syringe.
   c. choose appropriate needle.
   d. connect syringe and needle.

e. obtain alcohol swabs.

f. have correct medication card/sheet on working area.

Implementation

9. Read name of medication to be given from record.

10. Check label on medication and take from shelf or drawer.

11. Check label again, before pouring.

12. Draw up ordered medication.

    a. check medication for correct name.

    b. check expiration date of vial

    c. calculate correct dose

    d. check medication for correct strength.

    e. ascertain correct time to give.

    f. check route of administration to be used.

    g. gently rotate vial between palms.

    h. draw medication from vial; make sure you have exact volume needed.

    i. have another licensed nurse verify type, dosage, and expiration date.

    j. change needles.

    k. recheck name of medication prior to storage.

    l. replace medication into refrigerated area.

13. Place syringe, needle, and alcohol swab on tray.

14. Place patient medication card with medication. (Optional Step)

15. Approach and identify patient.

16. Explain to the patient and verify appropriate site.

17. Instruct for awareness of side effects such as bleeding gums, bruising, excessive menstrual flow, etc.

18. Provide privacy.

19. Choose site for injection (usually in abdomen)

    a. bunch fold of skin near site.

    b. cleanse site with alcohol swab.

    c. uncap needle

    d. with bevel up (toward head) inject needle quickly into site at 90° angle.

    e. do not aspirate.

    f. inject total amount of medication.

    g. wait a few seconds.

    h. withdraw needle from area along same needle path.

    i. do not massage the site afterwards.

    j. apply firm pressure to the injection site until all bleeding has stopped. (Helps prevent bruising)

    k. ice can be applied to site for 15-30 minutes for patients that bruise easily.

20. Immediately dispose of needle and syringe into puncture proof container.

    WARNING: Do not recap needle!

21. Wash hands.

Evaluation

22. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

23. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

JOB SHEET 15

ADMINISTER MEDICATIONS

OBJECTIVE 13o **Administer intramuscular injection.**

EQUIPMENT AND SUPPLIES

- Alcohol swabs
- 1 cc or 3 cc syringes
- 1", 1 1/2", and 2" needles with gauges 21-25
- Patient or mannikin with injectable areas
- Medication order
- Medication card/sheet
- Injectable IM medications

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Check medications listed against physician's orders.
3. Review information regarding the medications.
4. Assess size and general build of patient.
5. Assess need for assistance.
6. Determine appropriate needle and syringe to be used. (1", 1 1/2", and 2" needles with 21-25 gauge.)

Planning

7. Wash your hands.
8. Gather equipment.
    a. obtain medication ordered.
    b. choose appropriate syringe.
    c. choose appropriate needle.
    d. connect syringe and needle.

    e. obtain alcohol swabs.

    f. have correct medication card/sheet on working area.

Implementation

9. Read name of medication to be given from record.

10. Check label on medication and take from shelf or drawer.

11. Check label again, before pouring.

12. Draw up ordered medication

13. Re-examine vial or ampule to check the label a third time and recalculate the dosage.

14. Place syringe, needle, and alcohol swab on tray.

15. Place patient medication card with medication. (Optional Step)

16. Approach and identify patient.

17. Explain to the patient and verify appropriate site.

18. Provide privacy.

19. Choose site for injection.

    a. cleanse site with alcohol swab and allow to dry.

    b. uncap needle.

    c. with bevel up (toward head) inject needle quickly into site at 90° angle.

    d. aspirate a small amount.

    WARNING: Air is expected. If blood appears, remove needle immediately.

    e. inject total amount of medication.

    f. withdraw needle from area.

    g. gently message site.

20. Immediately dispose of needle and syringe into puncture proof container.

WARNING: Do not recap needle!

21. Leave patient in a comfortable position.

22. Wash your hands.

Evaluation

23. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

24. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

    f. If unusual circumstances exist, document differences in nurses notes.

JOB SHEET 16

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13p

Administer medication by z-tract method.

EQUIPMENT AND SUPPLIES

- Alcohol swabs
- 3 cc syringes
- 1 1/2" and 2" needles with gauges of 21-23
- Patient or mannikin with injectable areas
- Medication order
- Medication card/sheet
- Injectable IM medications

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. check medications listed against physician's or nurse's orders.
3. Review information regarding the medications.
4. Assess size and general build of patient.
5. Assess need for assistance.
6. Determine appropriate needle and syringe to be used. (1 1/2", and 2" needles with 21-23 gauge.)

Planning

7. Wash your hands.
8. Gather equipment.
   a. obtain medication ordered.
   b. choose appropriate syringe.
   c. choose appropriate needle.
   d. connect syringe and needle.

   e. obtain alcohol swabs.

   f. have correct medication card/sheet on working area.

Implementation

9. Read name of medication to be given from record.

10. Check label on medication and take from shelf or drawer.

11. Check label again, before drawing.

12. Draw up ordered medication

    a. check medication for correct name

    b. calculate correct dose

    c. ascertain correct time to give

    d. check route of administration to be used

    e. draw medication from vial

    f. recheck name of medication prior to storage

    g. replace medication into correct area

13. Re-examine vial or ampule to check the label a third time and recalculate the dosage.

14. Place syringe, needle, and alcohol swab on tray.

15. Place patient medication card with medication. (Optional Step)

16. Approach and identify patient.

17. Explain to the patient and verify appropriate site.

18. Provide privacy.

19. Choose site for injection.

    a. taut skin over site pulling to side

    b. cleanse site with alcohol swab

    c. uncap needle.

   d. with bevel up (toward head) inject needle quickly into site at 90° angle.

   e. aspirate a small amount

      WARNING: Air is expected. If blood appears, remove needle immediately.

   f. inject total amount of medication

   g. wait 10 seconds

   h. withdraw needle from area quickly

   i. release skin over area

20. Immediately dispose of needle and syringe into puncture proof container

    WARNING: Do not recap needle!

21. Wash hands

Evaluation

22. Evaluate according to the five rights and, if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

23. Record accurately according to the policy of the facility. Include:

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

    f. If unusual circumstances exist, document differences in nurses notes.

JOB SHEET 17

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13q

Administer an intradermal injection.

EQUIPMENT AND SUPPLIES

- Alcohol swabs
- 1 cc tuberculin syringes with 1/2" needles gauges 26-27
- Patient or mannikin with injectable areas
- Medication order
- Medication card/sheet
- Injectable intradermal medications

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Check medications listed against physician's orders.
3. Review information regarding the medications.
4. Assess size and general build of patient.
5. Assess need for assistance.
6. Determine appropriate needle and syringe to be used. (1/2" needle with 26-27 gauge.)

Planning

7. Wash your hands.
8. Gather equipment.
   a. obtain medication ordered.
   b. choose appropriate syringe.
   c. choose appropriate needle.
   d. connect syringe and needle. (if not prepackaged)
   e. obtain alcohol swabs.

f. have correct medication card/sheet on working area.

Implementation

9. Read name of medication to be given from record.
10. Check label on medication and take from shelf or drawer.
11. Check label again, before drawing.
12. Draw up ordered medication
    a. check medication for correct name
    b. check for expiration date
    c. calculate correct dose
    d. ascertain correct time to give
    e. check route of administration to be used
    f. draw medication from vial
    g. recheck name of medication prior to storage
    h. replace medication into correct area
13. Re-examine vial or ampule to check the label a third time and recalculate the dosage.
14. Place syringe, needle, and alcohol swab on tray.
15. Place patient medication card with medication. (Optional Step)
16. Approach and identify patient.
17. Explain to the patient and verify appropriate site.
    a. instruct for awareness of immediate allergic reaction.
18. Provide privacy.
19. Choose site for injection.
    a. taut skin over site
    b. cleanse site with alcohol swab
    c. uncap needle.

   - d. with bevel up (toward head) inject needle quickly into site at 15° angle.
   - e. lift skin slightly
   - f. inject total amount of medication
   - g. watch for bleb formation
   - h. withdraw needle from area

20. Immediately dispose of needle and syringe into puncture proof container

WARNING: Do not recap needle!

21. Mark location, date, and exact time of injection.

22. Leave patient in comfortable position.

23. Wash hands

Evaluation

24. Evaluate for redness and swelling.

Documentation

25. Record accurately according to the policy of the facility. Include:

   - a. name of medication
   - b. dosage
   - c. route
   - d. time of administration
   - e. signature
   - f. If unusual circumstances exist, document differences in nurses notes.

381

JOB SHEET 18

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13r

Combine medications for injection.

EQUIPMENT AND SUPPLIES

- Syringe or syringe-needle units
- Needles of appropriate length and gauge
- Alcohol swabs
- Two medication vials
- Medication orders
- Medication card/sheet
- Medication cart
- Medication tray

PROCEDURE

Assessment and Analysis

1. Obtain physician's orders for combined medication.
2. Check labels with orders.
3. Determine compatibility of two medications.
4. Determine amount of each medication.
5. Calculate amount of total injection.
6. Determine appropriate needle and syringe to be used.

Planning

7. Wash hands.
8. Obtain equipment.

Implementation

9. Cleanse top of each medication with an alcohol swab.
10. Pull back plunger to amount of first medication to be drawn.
11. Uncap needle and insert in vial of first medication.

12. Inject air into vial.
13. Invert vial and withdraw desired amount of medication.
14. Compare label for correct medication.
15. Withdraw needle.
16. Compare label for correct second medication
17. Insert needle into vial of second medication maintaining hold on plunger—Do not inject air at this point.
18. Compare label for correct medication.
19. Slowly withdraw correct amount of second medication.
20. Withdraw needle from vial.
21. Place cap on needle.
22. Place syringe-needle unit on medication tray.

JOB SHEET 19	ADMINISTER MEDICATIONS	IV

OBJECTIVE 13 a

Prepare injection from dry medication using diluent.

EQUIPMENT AND SUPPLIES

- Syringe
- Needles of appropriate length and gauge (minimum 2)
- Diluent (See label for appropriate diluent)
- Dry medication
- Medication tray
- Medication cart
- Alcohol swabs

PROCEDURE

Assessment and Analysis

1. Read label and determine diluent, quantity of diluent, resulting strength of solution.
2. Wash hands.
3. Calculate amount of medication to be drawn.

Planning

4. Prepare equipment.
5. Obtain dry medication comparing for right medication.
6. Read directions for diluent on label and/or product insert.
7. Cleanse top of dry medication vial.

Implementation

8. Draw correct amount of diluent from vial.
9. Tap dry medication vial to break up powder.
10. Insert needle into dry medication vial.
11. Inject diluent into dry medication.

12. Mix thoroughly.
13. Compare labels for correct medication.
14. Withdraw desired dose of medication.
15. Withdraw needle from dry medication vial.
16. Cap needle.
17. Change needles.
18. Compare label for correct medication and discard.
19. Place prepared injection on medication tray.

385

JOB SHEET 20

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13t

Administer rectal suppository.

EQUIPMENT AND SUPPLIES

- Rectal suppository (refrigerated)
- Water soluble lubricant
- Medicine cup
- Glove
- Medication order
- Medication card/sheet
- Medication cart
- Patient or mannikin
- Bed

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Verify medication order for rectal suppository.
   a. read doctor's order sheet.
   b. read medication card/sheet.
3. Check medications listed against physician's orders.
4. Check the 5 rights of medication administration.
   a. check the patient name.
   b. check the name of the medication.
   c. check dosage of the medication.
   d. check the route of medication.
   e. check the date and time for the medication.

Planning

5. Select and prepare equipment.
6. Wash hands.

Implementation

7. Verify medication 3 times during preparation.
    a. check when taken from shelf or drawer.
    b. check when placing suppository in cup.
    c. check when returning remainder to shelf or drawer.
8. Identify patient prior to giving medication.
    a. read identification band.
    b. verbalize or ask name for verification.
9. Provide for patient privacy.
10. Instruct patient of medication.
    a. state purpose of medication.
    b. state correct placement of medication.
    c. request patient defecate if possible.
    d. instruct patient to turn on left side with upper leg bent toward waist. (Sims' position)
    e. check for patient questions.
11. Drape patient to avoid exposure.
12. Apply glove.
13. Remove suppository from package.
14. Apply lubricant to tip of suppository. (cold water may be used)
15. Place the suppository at the anal opening.
16. Instruct patient to take a deep breath.

17. Gently insert suppository to 1 inch above internal sphincter.

18. Instruct patient to remain in position for 20 minutes.

19. Remove glove, keeping outside turned in, and discard materials.

20. Wash hands.

Evaluation

21. Evaluate according to five rights and if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

22. Document administration of rectal suppository.

    a. name of medication

    b. dosage

    c. route

    d. time of administration

    e. signature

    f. document instruction.

    g. document effects of medication.

388

JOB SHEET 21

ADMINISTER MEDICATIONS

IV

OBJECTIVE 13u

Administer vaginal medications.

EQUIPMENT AND SUPPLIES

- Vaginal medication
- Vaginal applicator (as indicated)
- Perineal pad
- Water-soluble lubricant
- 1 pair of gloves
- Paper towel
- Medication order
- Medication card/sheet
- Medication cart
- Patient or mannikin
- Bed

PROCEDURE

Assessment and Analysis

1. Assess medication record to identify which medication is to be given to the individual patient.
2. Verify medication order for vaginal suppository.
   a. read doctor's order sheet.
   b. read medication card/sheet.
3. Check medications listed against physician's orders.
4. Check the 5 rights of medication administration.
   a. check the patient name.
   b. check the name of the medication.
   c. check dosage of the medication.

   d. check the route of medication.

   e. check the date and time for the medication.

Planning

5. Determine and prepare equipment.

6. Wash hands.

Implementation

7. Verify medication 3 times during preparation.

   a. check when taken from shelf or drawer.

   b. check when placing suppository in cup.

   c. check when returning remainder to shelf or drawer.

8. Identify patient prior to giving medication.

   a. read identification band.

   b. verbalize or ask name for verification.

9. Provide for patient privacy.

10. Instruct patient of medication.

   a. state purpose of medication.

   b. state correct placement of medication.

   c. request patient void if possible.

   d. instruct patient to lay on back with knees bent and slightly separated. (Use dorsal recumbent position with knees flexed or Sims' position.)

   e. check for patient questions.

11. Drape patient to avoid exposure.

12. Place perineal pad beneath patient.

13. Apply glove.

14. Remove suppository from package.

15. Apply lubricant to tip of suppository, unless contraindicated.

16. Separate the labia with gloved, non-dominant hand.

17. Instruct patient to remain in position for 10 minutes.

18. Wrap applicator in paper towel.

19. Remove glove, keeping outside turned in.

20. Discard materials.

21. Wash hands.

Evaluation

21. Evaluate according to five rights and if appropriate to the drug, return in 30 minutes to check for desired effects and side effects.

Documentation

22. Document administration of vaginal medication.
    a. name of medication
    b. dosage
    c. route
    d. time of administration
    e. signature

23. Document instruction.

24. Document effects of medication.

PRACTICAL TEST 1

ADMINISTER MEDICATIONS

IV

JOB SHEET 1

Prepare an injection from a single or multi-dose vial.

Student's name ____________________ Date ________

Evaluator's name ____________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Verified medication order.		
a. read physician's order.	____	____
b. read the medication card/sheet.	____	____
2. Reviewed the literature specific to the medication.	____	____
3. Determined the correct dosage.	____	____
4. Determined the size of syringe needed.	____	____
Planning		
5. Washed hands.	____	____
6. Selected and organized the equipment.	____	____
7. Kept medication card or sheet in position for easy reading.	____	____
8. Obtained medication vial.	____	____
Implementation		
9. Compared name of medication with medication card/sheet.	____	____

The student:	Yes	No
10. Checked expiration date on the medication, and determined if medication was usable according to facility policy.		
11. Removed protective covering from vial if present.		
12. Cleansed rubber stopper with alcohol swab.		
13. Removed syringe from packaging; handled only barrel, flange of plunger and needle cap.		
14. Pushed plunger completely up within the barrel.		
15. Pulled plunger back to the desired dosage amount.		
16. Removed the needle cap.		
17. Inserted needle into the center of the vial; avoided any previous puncture sites.		
18. Injected air from syringe into air space of vial.		
19. Read for correct name; inverted vial with label toward nurse.		
20. Positioned needle lumen beneath the level of the fluid.		
21. Withdrew correct amount of medication.		
22. Removed air during preparation using appropriate method.		
23. Removed needle from vial.		
24. Recapped needle.		
25. Read label for correct medication.		
26. Returned medication to storage area.		
27. Placed injection on medication tray.		

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Prepared injection from a vial				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

______________ (Date)

______________________ (Evaluator's Signature)

______________________ (Evaluator's Position)

JOB SHEET 2

Preparation of injection from an ampule.

Student's name ____________________ Date __________

Evaluator's name ____________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Verified medication order.		
a. read physician's order.		
b. read medication card/sheet.		
2. Determined correct dosage.		
3. Determined the size of syringe needed.		
4. Verified that medication was not out-dated.		
Planning		
5. Washed hands.		
6. Selected and organized equipment.		
7. Obtained medication vial.		
8. Kept medication card or sheet in position for easy reading.		
Implementation		
9. Compared name of medication with medication card/sheet.		
10. Had all medication in base of ampule.		

The student:	Yes	No
11. Filed neck of ampule (optional step)		
12. Placed alcohol swab or gauze pad around neck of ampule.		
13. Applied solid pressure to top of ampule to break.		
14. Placed ampule on surface and discarded top.		
15. Placed filter needle on syringe.		
16. Inserted filter needle into ampule.		
17. Inverted ampule.		
18. Withdrew medication from ampule.		
19. Kept needle below the level of the fluid medication.		
20. Compared label with order for right medication.		
21. Removed filter needle from ampule.		
22. Rechecked label and discarded ampule appropriately.		
23. Discarded filter needle appropriately.		
24. Replaced filter needle with desired needle.		
25. Pushed medication to desired dose or until medication appeared at tip of needle.		
26. Capped needle and placed on medication tray.		
27. Washed hands.		

EVALUATOR'S COMMENTS ______________________________

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:

	4	3	2	1
Prepared an injection from an ampule				

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 3

ADMINISTER MEDICATIONS

IV

JOB SHEET 3

Administer sublingual medication.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Verified medication order for sublingual medication.		
a. read doctor's order sheet.	____	____
b. read medication card/sheet.	____	____
3. Checked the 5 rights or medication administration.		
a. checked the patient name.	____	____
b. checked the name of the medication.	____	____
c. checked the dosage of the medication.	____	____
d. checked the route of medication.	____	____
e. checked the date and time for the medication.	____	____
4. Reviewed the literature on specific medication.	____	____
5. Determined what equipment needed and determined correct dosage..	____	____

The student:	Yes	No
Planning		
6. Washed hands..	____	____
7. Gathered equipment..	____	____
Implementation		
8. Read name of medication from the record.	____	____
9. Checked label when taken from shelf or drawer.	____	____
10. Checked label when pouring medication.	____	____
11. Removed correct amount of medication:		
a. tablet		
1) poured from bottle into bottle cap unit; had correct dosage.	____	____
2) transferred to the medicine cup unless prepackaged.	____	____
b. unit - dose medication		
1) placed package containing medication in medicine cup.	____	____
12. Checked label when returned to shelf or drawer.	____	____
13. Placed medication on tray or cart.	____	____
14. Placed patient medication card with medication. (Optional Step)	____	____
15. Identified patient prior to giving medication.		
a. read identification band.	____	____
b. verbalized or asked name for verification.	____	____
16. Instructed patient on medication.		
a. stated purpose of medication.	____	____
b. stated correct placement of medication.	____	____
c. checked for patient questions.	____	____
17. Placed sublingual medication under tongue; used glove or had patient place under tongue and observed.	____	____
18. Watched patient to be sure medication was not swallowed. No water given.	____	____
19. Left patient in comfortable position.	____	____
20. Discarded medication cup as appropriate.	____	____
21. Washed hands.	____	____

The Student:	Yes	No
Evaluation		
22. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____
Documentation		
23. Recorded accurately according to the policies of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered sublingual medication				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

____
(Date)

____
(Evaluator's Signature)

____
(Evaluator's Position)

JOB SHEET 4

Administer buccal medication.

Student's name ____________________ Date __________

Evaluator's name ____________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	_____	_____
2. Verified medication order for buccal medication.		
a. read doctor's order sheet.	_____	_____
b. read medication card/sheet	_____	_____
3. Reviewed information regarding the medication.		
a. checked the patient name.	_____	_____
b. checked the name of the medication	_____	_____
c. checked the dosage of the medication	_____	_____
d. checked the route of medication.	_____	_____
e. checked the date and time for the medication.	_____	_____
4. Determined what equipment needed and safe dosage.	_____	_____

The student:	Yes	No
Planning		
5. Washed hands.	____	____
6. Gathered equipment.	____	____
Implementation		
7. Read name of medication from the record.	____	____
8. Checked when taken from shelf or drawer.	____	____
9. Checked when pouring medication.		
10. Removed correct amount of medication:		
a. tablet		
1) poured from bottle into bottle cap unit; had correct dosage.	____	____
2) transferred to the medicine cup unless prepackaged.	____	____
b. unit—dose medication		
1) placed package containing medication in medicine cup.	____	____
11. Checked when returned to shelf or drawer.	____	____
12. Placed medication on tray or cart.	____	____
13. Placed patient medication card with medication. (Optional Step)	____	____
14. Identified patient prior to giving medication.		
a. read identification band.	____	____
b. verbalized or asked name for verification.	____	____
15. Instructed patient on medication.		
a. stated purpose of medication.	____	____
b. stated correct placement of medication.	____	____
c. checked for patient questions.	____	____
16. Placed buccal medication between cheek and gum; used glove or had patient place between cheek and gum and observed.	____	____
17. Watched patient to be sure medication was not swallowed.	____	____
18. Left patient in comfortable position.	____	____
19. Discarded medication cup as appropriate.	____	____
20. Washed hands.	____	____

The student:	Yes	No
Evaluation		
21. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	___	___
Documentation		
22. Recorded accurately according to the policies of the facility. Included:		
a. name of medication	___	___
b. dosage	___	___
c. route	___	___
d. time of administration	___	___
e. signature	___	___

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered buccal medication				

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

________________ (Date)

________________________ (Evaluator's Signature)

________________________ (Evaluator's Position)

PRACTICAL TEST 5

ADMINISTER MEDICATIONS

IV

JOB SHEET 5

Apply topical medication.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Verified medication order for topical medication.		
a. read doctor's order sheet.	____	____
b. read medication card/sheet.	____	____
3. Reviewed information regarding the medication.	____	____
4. Checked the 5 rights of medication administration.		
a. checked the patient name.	____	____
b. checked the name of the medication.	____	____
c. checked the dosage of the medication.	____	____
d. checked the route and location for medication.	____	____
e. checked the date and time for the medication.	____	____
5. Checked for clarification of method of application, if needed.	____	____

The student:	Yes	No
6. Reviewed the literature for the specific medication.		
7. Determined equipment needed and method of safe administration.		
8. Determined correct amount of medication.		
Planning		
9. Washed hands		
10. Gathered equipment		
Implementation		
11. Verified medication 3 times during preparation.		
a. checked when taken from shelf or drawer.		
b. checked when preparing medication.		
c. checked when returned to shelf or drawer.		
12. Identified patient prior to giving medication.		
a. read identification band.		
b. verbalized or asked name for verification.		
13. Instructed patient on medication.		
a. stated purpose of medication.		
b. stated correct placement of medication.		
c. stated care of site after application.		
d. checked for patient questions.		
14. Provided privacy.		
15. Applied glove.		
16. Removed old medication.		
17. Applied clean gloves.		
18. Applied topical medication as specified by orders.		
19. Applied dressing as specified.		
20. Washed hands.		

The student:	Yes	No
Evaluation		
21. Evaluated according to the five rights, and if appropriate, to the drug; returned in 30 minutes to check for desired effect and side effects.	____	____
Documentation		
22. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____
f. document instruction.	____	____
g. document administration of medication.	____	____
h. document effects of medication.	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Applied topical medication				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

____
(Date)

____
(Evaluator's Signature)

____
(Evaluator's Position)

PRACTICAL TEST 6

ADMINISTER MEDICATIONS

IV

JOB SHEET 6

Administer eye medication.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	_____	_____
2. Checked medications listed against physician's orders.	_____	_____
3. Reviewed information regarding the medication.	_____	_____
4. Determined accurate dosage and methods for safe administration.	_____	_____
Planning		
5. Determined what equipment was needed.	_____	_____
6. Washed hands.	_____	_____
7. Gathered equipment.	_____	_____
Implementation		
8. Read name of medication from record.	_____	_____
9. Checked label on medication and took from shelf or drawer.	_____	_____

The student:	Yes	No
10. Checked label again.		
11. Determined dropper was functional and accurate for amount needed.		
12. Checked label a third time.		
13. Placed medication on tray or cart.		
14. Placed patient medication card with medication. (Optional Step)		
15. Approached and identified patient.		
16. Explained what you were going to do and any specific related to drug.		
17. Washed hands.		
18. Tilted head back and supported on pillow.		
19. Instructed patient to look up.		
20. Observed condition of the eye.		
21. Removed exudate with saline moistened cotton ball wiping from inner canthus to outer canthus.		
22. Exposed the lower conjunctival sac.		
23. Applied medication.		
Solution:		
a. had patient look upward		
b. dropped specified number of drops into conjunctival sac.		
c. applied gentle pressure with tissue to inner canthus		
Ointment:		
a. applied thin line of ointment along lower conjunctival sac.		
b. instructed patient to close eyelids and roll eyes back and forth and up and down to spread ointment.		
24. Left patient in comfortable position.		
25. Discarded medication container as appropriate.		
Evaluation		
26. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.		

The student:	Yes	No
Documentation		
27. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered eye medication				

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" on the following page.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

__________ (Date)

____________________ (Evaluator's Signature)

____________________ (Evaluator's Position)

413

PRACTICAL TEST 7 — ADMINISTER MEDICATIONS — IV

JOB SHEET 7

Administer ear medication.

Student's name ____________________ Date __________

Evaluator's name ____________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	_____	_____
2. Checked medications listed against physician's orders.	_____	_____
3. Reviewed information regarding the medication.	_____	_____
4. Determined what equipment was need and accurate dosage.	_____	_____
Planning		
5. Washed hands.	_____	_____
6. Gathered equipment.	_____	_____
Implementation		
7. Read name of medication from record.	_____	_____
8. Checked label on medication and took from shelf or drawer.	_____	_____
9. Checked label again.	_____	_____

The student:	Yes	No
10. Removed correct amount of medication, determined that dropper was functional.	____	____
11. Returned bottle to shelf or drawer, checked label a third time.	____	____
12. Placed medication on tray or cart.	____	____
13. Placed patient medication card with medication. (Optional Step)	____	____
14. Approached and identified patient.	____	____
15. Explained what you were going to do and any specific related to drug.	____	____
16. Checked ear canal for excess wax.	____	____
17. Obtained order for irrigation if canal blocked by wax.	____	____
18. Positioned affected ear up.	____	____
19. Pulled earlobe correctly for age of patient.	____	____
20. Dropped medication into ear canal; Didn't touch ear or face with dropper.	____	____
21. Inserted cotton ball if ordered.	____	____
22. Instructed patient to keep ear up for several minutes.	____	____
23. Left patient in comfortable position.	____	____
24. Discarded medication container as appropriate.	____	____
25. Washed hands.	____	____

Evaluation

26. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____

Documentation

27. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:				
	4	3	2	1
Administered ear medication				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

______________ (Date)

______________________ (Evaluator's Signature)

______________________ (Evaluator's Position)

PRACTICAL TEST 8

ADMINISTER MEDICATIONS

IV

JOB SHEET 8

Administer nasal medication.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	_____	_____
2. Checked medications listed against physician's orders.	_____	_____
3. Reviewed information regarding the medication.	_____	_____
4. Determined what equipment was needed and accurate dosage.	_____	_____
Planning		
5. Washed hands.	_____	_____
6. Gathered equipment.	_____	_____
Implementation		
7. Read name of medication given from record.	_____	_____
8. Checked label on medication and took from shelf or drawer.	_____	_____

The student:	Yes	No
9. Checked label again.		
10. Determined correct amount of medication was available.		
11. Checked label a third time.		
12. Placed medication on tray or cart.		
13. Placed patient medication card with medication. (Optional Step)		
14. Approached and identified patient.		
15. Explained what you were going to do and any specific related to drug.		
16. Instructed patient to gently blow nose.		
17. Administered the medication.		
Drops:		
a. tilted head far back.		
b. instilled ordered drops into nostril(s)		
c. instructed patient to keep head back for 2 to 3 minutes		
Spray:		
a. shook spray bottle and held erect		
b. positioned head erect		
c. blocked one nostril		
d. instructed patient to breath slowly through unblocked nostril during puff		
e. instilled puff or spray		
18. Had tissues available but instructed to avoid blowing nose.		
19. Left patient in comfortable position.		
20. Discarded medication container as appropriate.		
21. Washed hands.		
Evaluation		
22. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.		

The student:	Yes	No
Documentation		
23. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered nasal medication				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

________________ __________________________________

(Date) (Evaluator's Signature)

____

(Evaluator's Position)

PRACTICAL TEST 9 — ADMINISTER MEDICATIONS — IV

JOB SHEET 9

Administer oral medication.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked medications listed against physician's orders.	____	____
3. Reviewed information regarding the medication.	____	____
4. Assessed patient's ability to swallow medications.	____	____
5. Assessed patient for need for p.r.n. medications.	____	____
6. Determined what equipment was needed and accurate dosage.	____	____
Planning		
7. Washed hands.	____	____
8. Gathered equipment.	____	____

The student:	Yes	No
Implementation		
9. Read name of medication given from record.	____	____
10. Checked label on medication and took from shelf or drawer.	____	____
11. Checked label again, before pouring.	____	____
12. Removed correct amount of medication.		
a. tablet or capsule		
1) poured from bottle into bottle cap until correct dosage.	____	____
2) transferred to the medicine cup unless prepackaged.	____	____
b. liquid		
1) removed bottle cap and placed it upside down on the countertop.	____	____
2) held cup at eye level, poured liquid to desired level.	____	____
3) poured with label facing up.	____	____
4) wiped neck of bottle before recapping.	____	____
c. unit dosage		
1) placed package containing medication in medicine cup.	____	____
13. Return bottle to shelf or drawer, checked label a third time.	____	____
14. Placed medication on tray or cart.	____	____
15. Placed patient medication card with medication. (Optional Step)	____	____
16. Approached and identified patient.	____	____
17. Explained what you were going to do and any specific related to drug. Stated medication is to be swallowed.	____	____
18. Gave patient a glass of water.	____	____
19. Observed patient to be sure medication was swallowed.	____	____
20. Left patient in comfortable position.	____	____
21. Discarded medication container as appropriate.	____	____
22. Washed hands.	____	____

The student:	Yes	No
Evaluation		
23. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.		
Documentation		
24. Recorded accurately according to the policy of the facility. Included:		
a. name of medication		
b. dosage		
c. route		
d. time of administration		
e. signature		

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:				
Administered oral medication	4	3	2	1

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

________________ ______________________________
(Date) (Evaluator's Signature)

____
(Evaluator's position)

PRACTICAL TEST 10

ADMINISTER MEDICATIONS

IV

JOB SHEET 10

Crush medication for administration.

Student's name ____________________ Date __________

Evaluator's name ____________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked the medications listed against the physician's orders.	____	____
3. Reviewed the literature or checked with the pharmacist about crushing specific medications.	____	____
4. Assessed the patient for the need for crushed medications.	____	____
5. Determined accurate dosage.	____	____
6. Determined equipment needed.	____	____
7. Determined the individual needs and preferences of each patient.	____	____
Planning		
8. Washed hands.	____	____
9. Obtained tablet to be crushed.	____	____
10. Organized equipment needed.	____	____

The student:	Yes	No
Implementation		
11. Poured tablet into lid of container; placed in souffle cup or medicine cup.	_____	_____
12. Placed tablet in crushing device.		
a. placed tablet in souffle cup into pill crusher OR	_____	_____
b. placed tablet into mortar.	_____	_____
13. Applied pressure for crushing.		
a. brought down handle of pill crusher.	_____	_____
b. brought down and hammered pill with pestle.	_____	_____
Evaluation		
14. Observe medication for completed crushing; repeated step 11 as needed.	_____	_____
15. Poured medication into final medicine cup.	_____	_____
16. Cleanse device for crushing	_____	_____
17. Washed hands.	_____	_____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:				
Crushed medication	4	3	2	1

EVALUATOR'S COMMENTS	____ ____ ____
AVERAGE RATING	**Evaluator note:** To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.
PERFORMANCE EVALUATION KEY	4 - Skilled—Can perform job with no additional training 3 - Moderately skilled—Has performed job during training program; limited additional training may be required 2 - Limited skill—Has performed job during training program; additional training is required to develop skill 1 - Unskilled—Is familiar with process; but is unable to perform job

____
(Date)

____
(Evaluator's signature)

____
(Evaluator's position)

JOB SHEET 11

Administer medication by nasogastric tube.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked the medications listed against the physician's orders.	____	____
3. Reviewed the literature for information specific to the medication.	____	____
4. Assessed the patency and placement of nasogastric tube just prior to administering any medications.	____	____
5. Read any notations on the chart about previous feedings.	____	____
6. Determined if medication could safely and effectively be given through the size nasogastric tube in place.	____	____
7. Determined if the effectiveness of the medication was altered by diluting or crushing.	____	____

The student:	Yes	No
8. Determined the safest patient position for administering medications via the nasogastric tube.	____	____
9. Determined required interventions for maintaining patency of the tube.	____	____
Planning		
10. Washed hands.	____	____
11. Gathered and organized needed equipment.	____	____
12. Obtained the correct medication.	____	____
Implementation		
13. Identified patient.	____	____
14. Instructed patient on medication.	____	____
a. stated purpose of medication.	____	____
b. stated that medication would be given through N/G.	____	____
c. checked for patient questions.	____	____
15. Assembled equipment at bedside.	____	____
a. placed perineal pad under N/G connection site.	____	____
b. provide water for flushing of tube.	____	____
c. placed asepto or bulb syringe on overbed table.	____	____
d. placed small syringe on overbed table.	____	____
e. had stethoscope available.	____	____
f. had medication on overbed table.	____	____
16. Positioned patient upright, if condition allowed	____	____
17. Checked placement of nasogastric tube.	____	____
a. aspirated stomach contents.	____	____
b. placed stethoscope over stomach and listened, as air was inserted, for gurgling sound. (preferred method)	____	____
c. placed unclamped N/G next to ear; listened for crackling noise.	____	____
d. placed end of N/G in water; watched for bubbling with respirations.	____	____
18. Clamped tubing and attached asepto or bulb syringe.	____	____

The student:	Yes	No
19. Poured water into syringe with tubing clamped.		
20. Unclamped and allowed to run by gravity.		
21. Observed for signs of aspiration.		
22. Clamped tubing and poured medication into syringe.		
23. Unclamped tubing and allowed to run by gravity.		
24. Repeated steps 22 and 23 for each medication.		
25. Clamped tubing and poured water into syringe.		
26. Unclamped tubing and allow to run by gravity.		
or		
27. Clamped tubing and reconnected to continuous feeding.		
28. Repositioned patient with head turned to one side.		
29. Washed hands.		
Evaluation		
30. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.		
Documentation		
31. Recorded accurately according to the policy of the facility. Included:		
a. name of medication		
b. dosage		
c. route		
d. time of administration		
e. signature		

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered medication by nasogastric tube				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

______________ (Date)

______________________ (Evaluator's Signature)

______________________ (Evaluator's position)

PRACTICAL TEST 12

ADMINISTER MEDICATIONS

IV

JOB SHEET 12

Administer subcutaneous injection.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked medications listed against physician's orders.	____	____
3. Reviewed information regarding the medication.	____	____
4. Assessed size and general build of patient.	____	____
5. Assessed need for assistance.	____	____
6. Determined appropriate needle and syringe to be used.	____	____
Planning		
7. Washed hands.	____	____
8. Gathered equipment.		
a. obtained medication ordered.	____	____
b. chose appropriate syringe.	____	____
c. chose appropriate needle.	____	____

The student:	Yes	No
d. connected syringe and needle.	____	____
e. obtained alcohol swabs.	____	____
f. had correct medication card/sheet on working area.	____	____
Implementation		
9. Read name of medication given from record.	____	____
10. Checked label on medication and took from shelf, drawer, or refrigerator.	____	____
11. Checked label again, before drawing.	____	____
12. Drew ordered medication	____	____
13. Re-examined vial or ampule; checked the label a third time and recalculated the dosage.	____	____
14. Placed syringe, needle, and alcohol swab on tray.	____	____
15. Placed patient medication card with medication. (Optional Step)	____	____
16. Approached and identified patient.	____	____
17. Explained to the patient and verified appropriate site.	____	____
18. Provided privacy.		
19. Chose site for injection.		
a. pinched skin around site.	____	____
b. cleansed site with alcohol swab.	____	____
c. uncapped needle.	____	____
d. with bevel up (toward head) injected needle quickly into site at 45° angle.	____	____
e. aspirated a small amount.	____	____
f. injected total amount of medication.	____	____
g. withdrew needle from area.	____	____
h. gently massaged site.	____	____
i. immediately disposed of needle and syringe in puncture proof container.	____	____
j. washed hands.	____	____
20. Left patient in a comfortable position.	____	____
21. Washed hands.	____	____

The student:	Yes	No
Evaluation		
22. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____
Documentation		
23. Recorded accurately according to the policy of the facility. Included:	____	____
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____
f. If unusual circumstances existed, documented differences in nurses notes.	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered subcutaneous injection				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

____________ (Date)

________________________ (Evaluator's Signature)

________________________ (Evaluator's position)

PRACTICAL TEST 13

ADMINISTER MEDICATIONS

IV

JOB SHEET 13

Administer subcutaneous insulin.

Student's name ____________________ Date ________

Evaluator's name ____________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked medications listed against physician's orders.	____	____
3. Reviewed information regarding the medications.	____	____
4. Assessed size and general build of patient.	____	____
5. Checked the chart to determine previous site of injection.	____	____
6. Assessed need for assistance.	____	____
7. Determined appropriate needle and syringe.	____	____
Planning		
8. Washed hands.	____	____
9. Gathered equipment.		
a. obtained medication ordered.	____	____

The student:	Yes	No
b. chose appropriate syringe.	____	____
c. chose appropriate needle.	____	____
d. connect syringe and needle.	____	____
e. obtained alcohol swabs.	____	____
f. had correct medication card/sheet on working area.	____	____
Implementation		
10. Read complete name of medication from record.	____	____
11. Checked label on medication and took from shelf or drawer.	____	____
12. Checked label again, before calculating and preparing dosage.	____	____
13. Drew up correct dosage of medication in units.	____	____
a. checked expiration date of vial.	____	____
b. gently rotated vial between palms.	____	____
c. drew medication from vial; confirmed exact volume needed.	____	____
d. had another licensed nurse verify type, dosage and expiration date.	____	____
e. rechecked name of medication prior to storage.	____	____
f. replaced medication in refrigerated area.	____	____
14. Placed syringe, needle, and alcohol swab on tray.	____	____
15. Placed patient medication cared with medication. (Optional Step)	____	____
16. Approached and identified patient.	____	____
17. Explained to the patient and verified appropriate site.	____	____
18. Instructed patient to watch for hypoglycemia.	____	____
19. Provided privacy.		
20. Chose site for injection		
a. pinched skin around site.	____	____
b. cleansed site with alcohol swab.	____	____
c. uncapped needle.	____	____
d. with bevel up (toward head) injected needle quickly into site at 45 angle.	____	____
e. aspirated a small amount.	____	____
f. injected total amount of medication.	____	____

The student:	Yes	No
g. withdrew needle from area.	____	____
h. pat site of injection, do not massage.	____	____
21. Immediately disposed of needle and syringe in puncture proof container; did not recap needle.	____	____
22. Washed hands.	____	____
Evaluation		
23. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____
Documentation		
24. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered subcutaneous insulin				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

____
(Date)

____
(Evaluator's Signature)

____
(Evaluator's Position)

PRACTICAL TEST 14

ADMINISTER MEDICATIONS

IV

JOB SHEET 14

Administer subcutaneous heparin.

Student's name ____________________ Date __________

Evaluator's name ____________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked medications listed against physician's orders.	____	____
3. Reviewed information regarding the medications.	____	____
4. Assessed size and general build of patient.	____	____
5. Assessed need for assistance.		
6. Determined appropriate needle and syringe.	____	____
Planning		
7. Washed hands.	____	____
8. Gathered equipment.		
a. obtained medication ordered.	____	____
b. chose appropriate syringe.	____	____
c. chose appropriate needle.	____	____

The student:	Yes	No
d. connected syringe and needle.	____	____
e. obtained alcohol swabs.	____	____
f. had correct medication card/sheet on working area.	____	____
Implementation		
9. Read name of medication from record.	____	____
10. Checked label on medication and took from shelf or drawer.	____	____
11. Checked label again, before pouring.	____	____
12. Drew up ordered medication.		
a. checked medication for correct name.	____	____
b. checked expiration date of vial.	____	____
c. calculated correct dose.	____	____
d. checked medication for correct strength.	____	____
e. ascertained correct time to give.	____	____
f. checked route of administration used.	____	____
g. gently rotated vial between palms.	____	____
h. drew medication from vial; confirmed exact volume needed.	____	____
i. had another licensed nurse verify type, dosage, and expiration date.	____	____
j. changed needles.	____	____
k. rechecked name of medication prior to storage.	____	____
l. replaced medication in refrigerated area.	____	____
13. Placed syringe, needle, and alcohol swab on tray.	____	____
14. Placed patient medication cared with medication. (Optional Step)	____	____
15. Approached and identified patient.	____	____
16. Explained to the patient and verified appropriate site.	____	____
17. Instructed for awareness of side effects such as bleeding gums, bruising, excessive menstrual flow, etc.	____	____
18. Provided privacy.	____	____
19. Chose site for injection (usually in abdomen)		
a. bunched fold of skin near site.	____	____
b. cleansed site with alcohol swab.	____	____
c. uncapped needle.	____	____

The student:	Yes	No
d. with bevel up (toward head) injected needle quickly into site at 45 angle.	____	____
e. Did not aspirate.	____	____
f. injected total amount of medication.	____	____
g. waited a few seconds.	____	____
h. withdrew needle from area along same needle path.	____	____
i. did not massage the site afterwards.	____	____
j. applied firm pressure to the injection site until all bleeding had stopped. (Helps prevent bruising)	____	____
k. ice can be applied to site for 15 to 30 minutes for patients that bruise easily.	____	____
20. Immediately disposed of needle and syringe in puncture proof container; did not recap needle.	____	____
21. Washed hands.	____	____
Evaluation		
22. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____
Documentation		
23. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____

EVALUATOR'S COMMENTS ______________________________

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:				
	4	3	2	1
Administered subcutaneous heparin				

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 15

ADMINISTER MEDICATIONS

IV

JOB SHEET 15

Administer intramuscular medication.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked medications listed against physician's orders.	____	____
3. Reviewed information regarding the medications.	____	____
4. Assessed size and general build of patient.	____	____
5. Assessed need for assistance.	____	____
6. Determined appropriate needle and syringe. (1", 1 1/2", and 2" needles with 21-25 gauge.)	____	____
Planning		
7. Washed hands.	____	____
8. Gathered equipment.		
a. obtained medication ordered.	____	____
b. chose appropriate syringe.	____	____

The student:	Yes	No
c. chose appropriate needle.		
d. connected syringe and needle.		
e. obtained alcohol swabs.		
f. had correct medication card/sheet on working area.		
Implementation		
9. Read name of medication from record.		
10. Checked label on medication and took from shelf or drawer.		
11. Checked label again, before pouring.		
12. Drew up ordered medication.		
13. Re-examined vial or ampule; checked the label a third time and recalculated the dosage.		
14. Placed syringe, needle, and alcohol swab on tray.		
15. Placed patient medication card with medication. (Optional Step)		
16. Approached and identified patient.		
17. Explained to the patient and verified appropriate site.		
18. Provided privacy.		
19. Chose site for injection.		
a. cleansed site with alcohol swab and allow to dry.		
b. uncapped needle.		
c. with bevel up (toward head) injected needle quickly into site at 90 angle.		
d. aspirated a small amount.		
e. injected total amount of medication.		
f. withdrew needle from area.		
g. gently massaged site.		
20. Immediately disposed of needle and syringe in puncture proof container; did not cap needle.		
21. Left patient in a comfortable position.		
22. Washed hands.		

The student:	Yes	No
Evaluation		
23. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	___	___
Documentation		
24. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	___	___
b. dosage	___	___
c. route	___	___
d. time of administration	___	___
e. signature	___	___
f. If unusual circumstances existed, documented differences in nurses notes.	___	___

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered intramuscular medication				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" on the following page.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

__________ (Date)

__________ (Evaluator's Signature)

____

__________ (Evaluator's Position)

PRACTICAL TEST 16

ADMINISTER MEDICATIONS

IV

JOB SHEET 16

Administer medication by z-tract method.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked medications listed against physician's orders.	____	____
3. Reviewed information regarding the medications.	____	____
4. Assessed size and general build of patient.	____	____
5. Assessed need for assistance.	____	____
	____	____
6. Determined appropriate needle and syringe. (1 1/2", and 2" needles with 21-23 gauge.)	____	____
Planning		
7. Washed hands.	____	____
8. Gathered equipment.		
a. obtained medication ordered.	____	____
b. chose appropriate syringe.	____	____

The student:	Yes	No
c. chose appropriate needle.		
d. connected syringe and needle.		
e. obtained alcohol swabs.		
f. had correct medication card/sheet on working area.		

Implementation

	Yes	No
9. Read name of medication from record.		
10. Checked label on medication and took from shelf or drawer.		
11. Checked label again, before drawing.		
12. Drew up ordered medication		
a. checked medication for correct name		
b. calculated correct dose		
c. ascertained correct time to give		
d. checked route of administration used		
e. drew medication from vial		
f. rechecked name of medication prior to storage		
g. replaced medication in correct area		
13. Re-examined vial or ampule; checked the label a third time and recalculated the dosage.		
14. Placed syringe, needle, and alcohol swab on tray.		
15. Placed patient medication card with medication. (Optional Step)		
16. Approached and identified patient.		
17. Explained to the patient and verified appropriate site.		
18. Provided privacy.		
19. Chose site for injection.		
a. taut skin over site pulled to side		
b. cleansed site with alcohol swab		
c. uncapped needle.		
d. with bevel up (toward head) injected needle quickly into site at 90 angle.		
e. aspirated a small amount		
f. injected total amount of medication		
g. waited 10 seconds		
h. withdrew needle from area quickly		
i. released skin over area		

The student:	Yes	No
20. Immediately disposed of needle and syringe in puncture proof container; did not recap needle.	____	____
21. Washed hands	____	____
Evaluation		
22. Evaluated according to the five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____
Documentation		
23. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____
f. If unusual circumstances existed, documented differences in nurses notes.	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered medication by z-tract method				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

____
(Date)

____
(Evaluator's Signature)

____
(Evaluator's Position)

PRACTICAL TEST 17

ADMINISTER MEDICATIONS

IV

JOB SHEET 17

Administer an intradermal injection.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Checked medications listed against physician's orders.	____	____
3. Reviewed information regarding the medications.	____	____
4. Assessed size and general build of patient.	____	____
5. Assessed need for assistance.	____	____
6. Determined appropriate needle and syringe. (1/2" needle with 26-27 gauge.)	____	____
Planning		
7. Washed hands.	____	____
8. Gathered equipment.		
a. obtained medication ordered.	____	____
b. chose appropriate syringe.	____	____

The student:	Yes	No
c. chose appropriate needle.		
d. connected syringe and needle. (if not prepackaged)		
e. obtained alcohol swabs.		
f. had correct medication card/sheet on working area.		
Implementation		
9. Read name of medication from record.		
10. Checked label on medication and took from shelf or drawer.		
11. Checked label again, before drawing.		
12. Drew up ordered medication		
a. checked medication for correct name		
b. checked for expiration date		
c. calculated correct dose		
d. ascertained correct time to give		
e. checked route of administration used		
f. drew medication from vial		
g. rechecked name of medication prior to storage		
h. replaced medication in correct area		
13. Re-examined vial or ampule; checked the label a third time and recalculated the dosage.		
14. Placed syringe, needle, and alcohol swab on tray.		
15. Placed patient medication card with medication. (Optional Step)		
16. Approached and identified patient.		
17. Explained to the patient and verified appropriate site.		
a. instructed for awareness of immediate allergic reaction.		
18. Provided privacy.		
19. Chose site for injection.		
a. taut skin over site		
b. cleansed site with alcohol swab		
c. uncapped needle.		
d. with bevel up (toward head) injected needle quickly into site at 90° angle.		
e. lifted skin slightly		
f. injected total amount of medication		

The student:	Yes	No
g. watched for bleb formation	____	____
h. withdrew needle from area quickly	____	____
20. Immediately disposed of needle and syringe in puncture proof container; did not recap needle.	____	____
21. Marked location, date, and exact time of injection.	____	____
22. Left patient in comfortable position.		
23. Washed hands	____	____

Evaluation

24. Evaluated for redness and swelling.	____	____

Documentation

25. Recorded accurately according to the policy of the facility. Included:		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____
f. If unusual circumstances existed, documented differences in nurses notes.	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered intradermal injection				

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 18

ADMINISTER MEDICATIONS

IV

JOBSHEET 18

Combine medications for injection.

Student's name ____________________ Date __________

Evaluator's name ____________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Obtained physician's orders for combined medication.	____	____
2. Checked labels with orders.	____	____
3. Determined compatibility of two medications.	____	____
4. Determined amount of each medication.	____	____
5. Calculated amount of total injection.	____	____
6. Determined appropriate needle and syringe.	____	____
Planning		
7. Washed hands.	____	____
8. Obtained equipment.	____	____
Implementation		
9. Cleansed top of each medication with an alcohol swab.	____	____
10. Pulled back plunger to amount of first medication drawn.	____	____

The student:	Yes	No
11. Uncapped needle and inserted in vial of first medication.		
12. Injected air into vial.		
13. Invert vial and withdrew desired amount of medication.		
14. Compared label for correct medication.		
15. Withdrew needle.		
16. Compared label for correct second medication.		
17. Inserted needle into vial of second medication maintainingheld plunger—Did not inject air at this point.		
18. Compared labels for correct medication.		
19. Slowly withdrew correct amount of second medication.		
20. Withdrew needle from vial.		
21. Placed cap on needle.		
22. Placed syringe-needle unit on medication tray.		

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:				
Combined medications	4	3	2	1

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 19

ADMINISTER MEDICATIONS

IV

JOB SHEET 19

Prepare injection from dry medication using diluent.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Read label and determined diluent, quantity of diluent, and resulting strength of solution.	____	____
2. Washed hands.	____	____
3. Calculated amount of medication to be drawn.	____	____
Planning		
4. Prepared equipment.	____	____
5. Obtained dry medication; compared for right medication.	____	____
6. Read directions for diluent on label and/or product insert.	____	____
7. Cleansed top of dry medication vial.	____	____
Implementation		
8. Drew correct amount of diluent from vial.	____	____

The student:	Yes	No
9. Tapped dry medication vial to break up powder.		
10. Inserted needle into dry medication vial.		
11. Injected diluent into dry medication.		
12. Mix thoroughly.		
13. Compared labels for correct medication.		
14. Withdrew desired dose of medication.		
15. Withdrew needle from dry medication vial.		
16. Replaced cap on needle.		
17. Changed needles.		
18. Compared label for correct medication and discarded.		
19. Placed prepared injection on medication tray.		

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Prepared injection from dry medication using diluent				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

____________________ (Date)

____________________ (Evaluator's Signature)

____________________ (Evaluator's Position)

PRACTICAL TEST 20

ADMINISTER MEDICATIONS

IV

JOB SHEET 20

Administer rectal suppository.

Student's name ______________________ Date ________

Evaluator's name ______________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	____	____
2. Verified medication order for rectal suppository.		
a. read doctor's order sheet.	____	____
b. read medication card/sheet.	____	____
3. Checked medications listed against physician's orders.	____	____
4. Checked the 5 rights of medication administration.		
a. checked the patient name.	____	____
b. checked the name of the medication.	____	____
c. checked dosage of the medication.	____	____
d. checked the route of medication.	____	____
e. checked the date and time for the medication.	____	____

The student:	Yes	No
Planning		
5. Selected and prepared equipment.	____	____
6. Washed hands.	____	____
Implementation		
7. Verified medication 3 times during preparation.		
a. checked when taken from shelf or drawer.	____	____
b. checked when placed suppository in cup.	____	____
c. checked when returning remainder to shelf or drawer.	____	____
8. Identify patient prior to giving medication.		
a. read identification band.	____	____
b. verbalized or asked name for verification.	____	____
9. Provided for patient privacy.		
10. Instructed patient on medication.		
a. stated purpose of medication.	____	____
b. stated correct placement of medication.	____	____
c. request patient defecate if possible.	____	____
d. instructed patient to turn on left side with upper leg	____	____
bent toward waist. (Sims' position)	____	____
e. checked for patient questions.	____	____
11. Draped patient to avoid exposure.	____	____
12. Applied glove.	____	____
13. Removed suppository from package.	____	____
14. Applied lubricant to tip of suppository.	____	____
15. Placed the suppository at the anal opening.	____	____
16. Instructed patient to take a deep breath.	____	____
17. Gently insert suppository to 1 inch above internal sphincter.	____	____
18. Instructed patient to remain in position for 20 minutes.	____	____
19. Removed glove, kept outside turned in, discarded materials.	____	____
20. Washed hands.	____	____

The student:	Yes	No
Evaluation		
21. Evaluated according to five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____
Documentation		
22. Documented administration of rectal suppository.		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____
23 Documented instruction.	____	____
24. Documented effects of medication.	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered rectal suppository				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

____
(Date)

____
(Evaluator's Signature)

____
(Evaluator's Position)

JOB SHEET 21

Administer vaginal medication.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Write a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Assessed medication record; identified which medication was to be given to the individual patient.	_____	_____
2. Verified medication order for vaginal suppository.		
a. read doctor's order sheet.	_____	_____
b. read medication card/sheet.	_____	_____
3. Checked medications listed against physician's orders.	_____	_____
4. Checked the 5 rights of medication administration.		
a. checked the patient name.	_____	_____
b. checked the name of the medication.	_____	_____
c. checked dosage of the medication.	_____	_____
d. checked the route of medication.	_____	_____
e. checked the date and time for the medication.	_____	_____

The student:	Yes	No
Planning		
5. Determined and prepared equipment.		
6. Washed hands.		
Implementation		
7. Verified medication 3 times during preparation.		
a. checked when taken from shelf or drawer.		
b. checked when placing suppository in cup.		
c. checked remainder when returned to shelf or drawer.		
8. Identified patient prior to giving medication.		
a. read identification band.		
b. verbalized or asked name for verification.		
9. Provided for patient privacy.		
10. Instructed patient on medication.		
a. stated purpose of medication.		
b. stated correct placement of medication.		
c. requested patient to void if possible.		
d. instructed patient to lay on back with knees bent and slightly separated. (Used dorsal recumbent position with knees flexed or Sims' position.)		
e. checked for patient questions.		
11. Draped patient to avoid exposure.		
12. Placed perineal pad beneath patient.		
13. Applied glove.		
14. Removed suppository from package.		
15. Applied lubricant to tip of suppository, unless contraindicated		
16. Separated the labia with gloved, nonodominant hand.		
17. Instructed patient to remain in position for 10 minutes.		
18. Wrapped applicator in paper towel.		
19. Removed glove, kept outside turned in.		
20. Discarded materials.		

The student:	Yes	No
21. Washed hands.	____	____
Evaluation		
22. Evaluated according to five rights and, if appropriate, to the drug; returned in 30 minutes to check for desired effects and side effects.	____	____
Documentation		
23. Documented administration of vaginal medication.		
a. name of medication	____	____
b. dosage	____	____
c. route	____	____
d. time of administration	____	____
e. signature	____	____
24. Documented instruction.	____	____
25. Documented effects of medication.	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Administered vaginal medication				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

____
(Date)

____
(Evaluator's Signature)

____
(Evaluator's Position)

WRITTEN TEST

ADMINISTER MEDICATIONS IV

NAME ______________________________ SCORE ______

OBJECTIVE 1

Utilize patient assessment data prior to medication administration. Write the letter of the correct answer in the blanks provided.

___ 1. The factor which changes significantly during the aging process is

a. allergies

b. drug tolerance

c. drug interaction

d. physical state

___ 2. The factor on which the nurse has the greatest impact is

a. patient knowledge

b. desired effect

c. treatment goals

d. emotional state

___ 3. Which assessment factor may only be assessed after the administration of the medication?

a. Desired effect

b. Emotional state

c. Physical state

d. Drug tolerance

____4. **A physical state which influences the route of administration of a medication is**

a. vomiting

b. headache

c. pain

d. sleep

____5. Which information should provide the most thorough baseline data for assessments made for medication?

a. nurse's notes

b. physician's orders

c. medication history

d. medication sheet

OBJECTIVE 2

Verify the five rights of medications administration prior to administering medication. Write the letter of the correct answer in the blanks provided.

____1. The right time for a routine medication administration is usually determined by the physician's order and

a. nurse's schedule

b. total number of medications being given

c. facility policy

d. home schedule for other medications

____2. What usually determines the right time to administer a routine medication?

a. Hospital policy

b. Patient preference

c. Nurse's convenience

d. Pharmacy delivery schedule

___ 3. A patient who is unable to respond should be identified by

a. asking for finger squeeze or eye blink

b. asking a visitor at the bedside

c. checking the I.D. band

d. checking the tag on the door

OBJECTIVE 3

Verify a medication during preparation. Write the letter of the correct answer in the blank.

___ 1. How may times should routine checking for verification of medication name occur during preparation?

a. once

b. twice

c. three times

d. five times

OBJECTIVE 4

Identify various systems of medication distribution. Write the letter of the correct answer in the blanks provided.

___ 1. The individual prescription order system, is most commonly used for

a. general hospital units

b. intensive care units

c. home medication

d. none of the above

___ 2. The unit dose system provides packaging for the individual

a. patient

b. dosage

c. medication

d. all of the above

OBJECTIVE 5

Identify the various forms of medication. Write the letter of the correct answer in the blanks provided.

____1. Counterirritant used externally

____2. External medication applied for slow absorption

____3. Drug in substance which melts at body temperature

____4. Liquid for external application

____5. Liquid medication with alcohol base

____6. Medication applied with a gentle patting motion.

a. suppository

b. elixir

c. transdermal patch

d. liniment

e. lotion

f. medicated lotion

g. Emulsion

h. Syrup

i. solution

j. Capsule

____7. A sublingual tablet is placed

a. under the tongue

b. between the cheek and gum

c. between tongue and cheek

d. in the axilla

____8. The form of drug delivery system in which fine droplets are dispensed is

a. inhalant

b. nebulizer

c. syringe

d. medicine dropper

___ 9. The action necessary for the nurse administering medication by inhaler is

a. have ambu bag at bedside

b. have bite stick at bedside

c. read package insert

d. have charge nurse demonstrate use of inhaler

___ 10. Which container of injectable medication comes in both single and multi-dose forms?

a. Ampule

b. Vial

c. Cartridge

d. All of the above

___ 11. Which type of solution has an oily base?

a. Aqueous

b. Hydrus

c. Lipous

d. Viscous

___ 12. The form of medication administration equipment which can only be used for solid medications is

a. souffle cup

b. plastic medicine cup

c. syringe

d. inhaler

OBJECTIVE 6

Select appropriate guidelines for administering medications other than injections. Write the letter of the correct answer in the blanks provided.

____1. Generally, medicated ointments should be applied

a. as a thin covering

b. as a thick covering

c. only if dressings are used

d. with gentle patting motions

____2. Buccal medication is placed

a. under the tongue

b. between the cheek and gum

c. between the tongue and cheek

d. in the axilla

____3. When comatose or unable to swallow, a patient may require medication to be administered

a. orally

b. sublingually

c. through a nasogastric tube

d. all of the above

____4. One of the rarest types of medication administered is

a. sublingual

b. buccal

c. oral

d. topical

___ 5. Most ear medications are

a. lotions

b. sprays

c. drops

d. suppositories

___ 6. Eye medications in ointment form

a. should be given O.U.

b. usually do not interfere with vision

c. should be administered at body temperature

d. may alter visual acuity

___ 7. Sprays and drops are the most common form of

a. topical medication

b. nasal medication

c. oral medication

d. ophthalmic medication

___ 8. The preferred position for the patient during administration of vaginal medication is

a. Sims'

b. prone

c. lithotomy

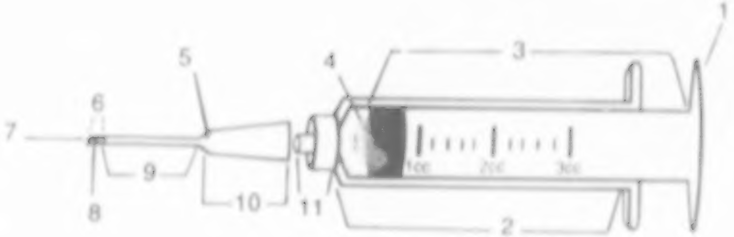
d. any of the above

OBJECTIVE 7

Identify the parts of a syringe and needle. Write the letter of the correct answer in the blanks provided.

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______
11. ______

a. shaft
b. tip
c. bevel
d. plunger
e. hilt
f. flange
g. lumen
h. hub
i. point
j. barrel
k. calibrations



OBJECTIVE 8

Select appropriate guidelines for administering intramuscular, subcutaneous, and intradermal injections. Write the letter of he correct answer in the blanks provided.

___ 1. Which needle would be the best choice to use for administering a tuberculin injection?

a. 3/8" 27 g

b. 5/8" 23 g

c. 1" 22 g

d. 1 1/2" 22 g

___ 2. When giving an irritating medication to a 200 lb man, which should be given Z-tract, the best needle to use would be?

a. 1/2" 25 g

b. 1" 23 g

c. 1" 21 g

d. 1 1/2" 23 g

___ 3. What is the maximum amount for a intramuscular injection?

a. 1 cc

b. 2 cc

c. 3 cc

d. 4 cc

___ 4. The site of choice in adults for intramuscular injection is

a. deltoid

b. vastus lateralis

c. ventrogluteal

d. dorsogluteal

____5. The intramuscular site which should be avoided when administering heavy or irritating medications is

a. deltoid

b. vastus lateralis

c. ventrogluteal

d. dorsogluteal

____6. The subcutaneous site that is least accessible for diabetic giving self injections at home is

a. upper thigh

b. upper arm

c. upper abdomen

d. lower abdomen

____7. The intradermal area used for allergy testing is usually the

a. upper arms

b. lower arms

c. upper legs

d. upper back

OBJECTIVE 9

Identify methods used when administering medications to a young child or infant. Write the letter of the correct answer in the blank provided.

____1. When giving small child or an infant an intramuscular injection, where should you inject the medication?

a. Deltoid

b. Vastus lateralis

c. Rectus femoris

d. Ventrogluteal

___ 2. It is NOT recommended to

a. hold a child's nose to make him swallow

b. crush medications and add them to pleasant-tasting solutions

c. restrain a child

d. allow child to ask questions

OBJECTIVE 10 **Identify methods used to read a medicine glass.** Write the letter of the correct answer in the blank provided.

___ 1. Most medicine glasses are labeled with

a. apothecary measurements

b. metric measurements

c. household measurements

d. all of the above measurements

___ 2. To read a medicine glass correctly, you must

a. disregard the meniscus

b. use the lowest point for determining the amount in the glass.

c. use the highest point for determining the amount in the glass.

d. wait for the liquid to become even on top

NOTICE The following assignment sheets and job sheets are not a part of the written test. If these activities have not been completed, check with your instructor.

OBJECTIVE 11 **Communicate appropriately during administration of medication.** SCORE ____

OBJECTIVE 12 **Read a medicine glass.** SCORE ____

OBJECTIVE 13 a	Prepare an injection from a single or multi-dose vial.	RATING ___
OBJECTIVE 13 b	Prepare an injection from an ampule.	RATING ___
OBJECTIVE 13 c	Administer sublingual medication.	RATING ___
OBJECTIVE 13 d	Administer buccal medications.	RATING ___
OBJECTIVE 13 e	Apply topical medication.	RATING ___
OBJECTIVE 13 f	Administer Eye medications.	RATING ___
OBJECTIVE 13 g	Administer ear medications	RATING ___
OBJECTIVE 13 h	Administer Nasal medication.	RATING ___
OBJECTIVE 13 i	Administer oral medications.	RATING ___
OBJECTIVE 13 j	Crush medications for administration.	RATING ___
OBJECTIVE 13 k	Administer medication by a nasogastric tube.	RATING ___
OBJECTIVE 13 l	Administer subcutaneous injection.	RATING ___
OBJECTIVE 13 m	Administer subcutaneous insulin.	RATING ___
OBJECTIVE 13 n	Administer subcutaneous heparin.	RATING ___
OBJECTIVE 13 o	Administer intramuscular injection.	RATING ___
OBJECTIVE 13 p	Administer medication by the z-tract method.	RATING ___

OBJECTIVE 13 q	**Administer an intradermal injection.**	RATING ____
OBJECTIVE 13 r	**Combine medications for an injection.**	RATING ____
OBJECTIVE 13 s	**Prepare an injection from dry medication using diluent.**	RATING ____
OBJECTIVE 13 t	**Administer a rectal suppository.**	RATING ____
OBJECTIVE 13 u	**Administer vaginal medications.**	RATING ____

WRITTEN TEST ANSWERS

ADMINISTER MEDICATIONS IV

OBJECTIVE 1	1. b	
	2. a	
	3. d	
	4. a	
	5. c	
OBJECTIVE 2	1. c	
	2. a	
	3. c	
	4. d	
OBJECTIVE 3	1. c	
OBJECTIVE 4	1. c	
	2. b	
OBJECTIVE 5	1. d	7. a
	2. c	8. a
	3. a	9. c
	4. e	10. b
	5. b	11. d
	6. f	12. a

OBJECTIVE 6

1. a
2. b
3. c
4. b
5. c
6. d
7. b
8. c

OBJECTIVE 7

1. f
2. j
3. d
4. k
5. e
6. c
7. i
8. g
9. a
10. h
11. b

OBJECTIVE 8

1. a
2. d
3. c
4. d
5. a
6. b
7. d

OBJECTIVE 9

1. b
2. a

OBJECTIVE 10

1. d
2. b

OBJECTIVE 11

Refer to answers to Assignment Sheet 1.

OBJECTIVE 12	Refer to answers to Assignment Sheet 2.
OBJECTIVES 13 a-u	Refer to Practical Tests for Job Sheets 1 through 21.

OBJECTIVE SHEET

ASSIST WITH INTRAVENOUS THERAPY

V

INTRODUCTION

The administration of intravenous (IV) therapy is a complex, dependent intervention that requires cooperation of the entire health care team to provide for safety of the patient. The physician determines the type of fluid and administration rate, and the nursing staff administers the intravenous therapy and provides for safety and comfort of the patient. The role of the practical nurse varies with each facility in regards to specific responsibilities for management of patients with intravenous therapy, but a sound knowledge base of this treatment is necessary to give safe bed-side nursing care.

This unit will cover the basic information for maintaining an intravenous system and watching for effects of the medication. Most practical nurses require additional training before assuming complete responsibility for administration of intravenous medications.

PREREQUISITES

Before studying this unit, the student should have successfully completed units on "Calculate Medication Dosage," "Document Medications," "Identify Classification and Effects of Medications," and "Administer Medications."

UNIT OBJECTIVE

After completing this unit, the student should be able to maintain intravenous therapy and recognize effects of that therapy. The student will show these competencies by completing the assignment sheet, job sheets, practical tests and written test with a minimum of 85 percent accuracy.

SPECIFIC OBJECTIVES

1. Identify the general purposes for intravenous therapy.
2. Distinguish among the methods of medication administration using intravenous therapy.
3. Identify common sites for intravenous therapy.
4. Distinguish among the effects of isotonic, hypotonic and hypertonic intravenous fluid.
5. Identify the advantages and disadvantages of intravenous therapy.
6. Discuss the steps of the nursing process as they relate to patients receiving IV therapy.

7. Calculate rate of flow of IV fluids.

8. Select appropriate guidelines for assisting with IV therapy.

9. Identify the purpose and risks of infusion pumps.

10. Apply the nursing process to care for patients receiving intravenous therapy. (Assignment Sheet 1)

11. Demonstrate the ability to

    a. Assess and document IV therapy. (Job Sheet 1)

    b. Change peripheral IV tubing. (Job Sheet 2)

    c. Change IV dressings. (Job Sheet 3)

    d. Discontinue intravenous therapy. (Job Sheet 4)

    e. Convert an IV to a heparinized lock and maintain. (Job Sheet 5)

    f. Change flow rate. (Job Sheet 6)

    g. Change IV container. (Job Sheet 7)

487

SUGGESTED ACTIVITIES

ASSIST WITH INTRAVENOUS THERAPY V

PREPARATION

- Order films, videotapes, and other media to supplement unit
- Contact guest speakers.

  NOTE: Please provide the guest speaker with the specific topic relevant to the unit of instruction ahead of time. Call the guest speaker a day or two before his/her scheduled appearance to confirm the appointment.
- Develop a bulletin board or display that illustrates equipment used in IV therapy.
- Provide equipment for students to use to practice skills.

DELIVERY

- Discuss unit objective.
- Have guest speakers discuss the role of the LPN in regard to IVs in the local facilities.
- Have LPN speak on the expectations of new graduates and the importance of facility training in IV therapy and care.
- Have students give experience with IVs and site observations which they have had.

Objective 1

- Utilize patients in clinical areas to identify specific purposes for intravenous therapy.
- Have physician or pharmacist speak on the way choices can be made in ordering IV therapy.

Objective 2

- Show Transparencies.
- Demonstrate the four different methods.
- Show the equipment used for each method of administration.
- Give abbreviations which local facility uses for each method. (Some facilities use IVPB to mean IV piggyback; while others use the same abbreviations for IV push bolus.)

Objective 3 and 4

- Discuss common sites for IV therapy.
- Discuss advantages/disadvantages of each site.
- Give student's specific diagnoses and symptoms that would require an IV solution. Have the students identify which type of solution should be used and why.

  WARNING: Remind students that nurses do no make the decision but should be familiar with information to help ensure safety of patient.

- Illustrate effects of hypotonic solutions on cells by using water and sponge. The cells of a dry sponge are dehydrated and absorb the water through the same type of processes as the dehydrated patient absorbs the hypotonic solution. Discuss that the sponge's natural habitat is the ocean which is hypertonic to humans, but isotonic to the sponge which allows it to maintain shape while living and growing.
- Discuss the use of fluids with no or minimal dextrose for diabetic patients.
- Emphasize cautions in the use of various fluids.

Objective 5

- Discuss the advantages and disadvantages for both medications and the fluid therapy of IVs.
- Utilize past experiences for desired and undesired effects of IVs.
- Have students role play choosing their own IV given a variety of problems.
- Stress the safety factors and the importance of constant monitoring.

Objective 6

- Have students work with IV team, if one is used, in the local facility.

Objective 7

- Demonstrate preferred method of calculation.

- Have students utilize skill with clinical patients with observation by instructor.
- Discuss documentation of IV intake.
- Use Activity Sheets 1 and 2 to give students practice.
- Point out to students that abbreviations, methods, and terms used may vary and that facility policy should be determined and followed.
- Have students practice effective documentation.

Objective 8

- Discuss general guidelines.
- Discuss guidelines for changing IV dressings.
- Discuss guidelines for changing IV containers.
- Discuss guidelines for converting an IV to a heparinized lock.
- Discuss guidelines for discontinuing an intravenous infusion.
- Include nursing process which results from IV on nursing care plans.

Objective 9

- Show pictures of most recent types of infusion ports.
- Obtain guest speaker who has infusion port or specializes in the care of infusion ports.
- Demonstrate the differences in needles used with infusion ports.
- Discuss the purpose and risks of infusion pumps.
- Demonstrate use of the most recent and common controllers and pumps in local facility.
- Have students problem solve and generalize about risks which may be connected with the controllers in the local facility.
- Discuss the choice of whether to use controllers or not in certain settings: ICU, emergency room, general med-surg floor, pediatrics.

APPLICATION

Objective 10

- Have students work in groups to think of better solutions to their individual answers on the assignment sheet.

Objective 11a

- Discuss assessment data
- Demonstrate procedures to collect assessment data
- Discuss importance of documentation of assessment data
- Practice appropriate documentation procedures

Objective 11b

- Demonstrate procedure.
- Demonstrate procedure of changing tubing with different pumps and controllers.

Objective 11c

- Demonstrate procedure.
- Provide dressing material used in local facilities, and use IV arm.

  Discuss preference of local facility.
- Utilize actual patients and observe techniques.

Objective 11d

- Demonstrate procedure.
- Discuss local policy regarding sending tip of catheter to lab for detection of possible sepsis.

Objective 11e

- Demonstrate procedure.
- Utilize several different heparin lock devices.
- Provide sample of heparin flush solution to compare to heparin for subcutaneous use.

Objective 11f

- Demonstrate procedure.

- Discuss need for complete documentation.

Objective 11g

- Demonstrate procedure.
- Discuss safety tips.
- Discuss need for complete documentation.

EVALUATION

Pretest

- Pretest qualifying students.
- Determine individual study requirements from pretest results.
- Counsel students individually on pretest results and study requirements.
- Modify materials in unit or create supplementary materials for individual students as required.

Practical Test

- Evaluate each student in the nursing lab using the Job Sheet check list.
- Reevaluate those students who have not performed satisfactorily in the nursing lab.
- Evaluate each student in the clinical setting using the Job Sheet check list.
- Reevaluate those students who have not performed satisfactorily in the clinical setting.
- Complete appropriate section of competency profile.

Written Test

- Explain to students that they will be asked to demonstrate on the written test the actions listed in the specific objectives.
- Give written test.
- Evaluate students on assignment sheet activities.
- Reteach and retest if necessary.
- Complete appropriate section of competency profiles if applicable.

- Review individual and group performance in order to evaluate teaching methods. Adjust scope, sequence, or instructional approaches for additional lessons as required.

UNIT RESOURCES

Audiovisual Material

- "Detecting and Managing I.V. Therapy Problems," Springhouse Corporation, Springhouse, PA 19477.

UNIT REFERENCES

Publications

- Clayton, Bruce D., Stock, Yvonne N., and Squire, *Jessie E. Squire's Basic Pharmacology for Nurses*, 8th ed., C.V. Mosby Company, St. Louis, MO 1985.
- Millam, Doris A. "Managing Complications of I.V. Therapy", *Nursing 88*, March 1988.
- "Medications and I.V.'s", *Nursing 87 Books*, Springhouse Corporation, 1111 Bethlehem Pike, Springhouse, PA 19477, 1987.
- "Monitoring Fluid and Electrolytes Precisely", 2nd ed. *Nursing 84 Books*, Spring Corporation, Springhouse, PA 19477, 1984.
- "Procedures: Nurse's Reference Library," *Nursing 85 Books*, Springhouse Corporation, Springhouse, PA 19477, 1985.

PRETEST ANSWERS

ASSIST WITH INTRAVENOUS THERAPY

IV

OBJECTIVE 1

1. b
2. d

OBJECTIVE 2

1. b
2. d
3. c
4. b
5. a
6. b
7. a
8. b
9. c

OBJECTIVE 3

1. c
2. a

OBJECTIVE 4

1. b
2. a
3. c
4. d
5. c
6. a
7. d
8. b

OBJECTIVE 5

1. D
2. D
3. D
4. A
5. D
6. A
7. A

OBJECTIVE 6

Possible answers include

Assessment

Should include information about initial assessments and on-going patient assessments.

Analysis

Should include information about indications of complications or assessments which should be reported to charge nurse. Common malfunctions and approaches to solving the problems should be mentioned.

Planning

Should include information about knowing facility policy and procedures. Various equipment for administering or maintaining IV therapy.

Implementation

Should include sterile technique in regard to piggy-back medications, maintaining dressing sites, function of equipment and flow rates.

Evaluation

Should include assessment of data that indicates effectiveness of IV therapy and required documentations.

OBJECTIVE 7

1. 55.5 or 56 gtt/min
2. 50 gtt/min
3. 41.6 or 42 gtt/min
4. 16.6 or 17 gtt/min
5. 350 cc
6. a. 666 cc approximately 650
    b. 734 cc approximately 750
    c. 541 cc approximately 550
    d. 658 cc approximately 650

OBJECTIVE 8

1. d
2. c
3. d
4. b
5. d
6. b
7. b
8. c
9. c
10. d
11. d

OBJECTIVE 9

1. a
2. d
3. a

OBJECTIVE 10 Refer to answers to Assignment sheet 1.

OBJECTIVE 11 Refer to Practical Tests for Job Sheets 1 through 7.

PRETEST

ASSIST WITH INTRAVENOUS THERAPY

V

NAME ______________________________ SCORE _______

OBJECTIVE 1

Identify the general purposes for intravenous therapy. Write the letter of the correct answer in the blank provided.

___ 1. The most common reason for intravenous therapy is

a. medication administration

b. fluid replacement

c. slow, steady administration of medication

d. fluid management

___ 2. Intravenous therapy is a method of

a. administering medications directly into the arterial system

b. administering medications directly into the cells

c. administering medications directly into muscle or organ tissue

d. administering medications directly into the vascular system

OBJECTIVE 2

Distinguish among the methods of medication administration using intravenous therapy. Write the letter of the correct answer in the blank provided.

___ 1. The piggyback method of intravenous fluid administration delivers fluid with the use of

a. pressure

b. gravity

c. suction

d. none of the above

____2. Which method of administration is used most often for intermittent administration of intravenous antibiotics?

a. Bolus

b. Push

c. Additive to fluid

d. Piggyback

____3. Which fluid will run in first when two bags of fluid are running into the same line?

a. The smaller bag

b. The larger bag

c. The higher bag

d. The lower bag

____4. Fluid added to a volume control set drip chamber should be infused in

a. 15-30 min.

b. 30-120 min.

c. 2-4 hrs.

d. 4-8 hrs.

____5. Which injection port should be used for an IV push or bolus?

a. Closest to cannula

b. Closest to fluid

c. Any port after the filter

d. Most conveniently located

____6. Where is the most likely area to find an infusion port?

a. Iliac crest

b. Chest wall

c. Antecubital space

d. Anterior forearm

___ 7. The goal of care of the infusion port site is

a. reduction of infection

b. maintenance of mobility

c. frequent utilization

d. acceptance by client

___ 8. Most intravenous fluid administration sets work by

a. pressure

b. gravity

c. suction

d. none of the above

___ 9. What is the purpose of a laminar flow hood?

a. Aerate intravenous fluid

b. Increase oxygen in fluid

c. Decrease microbial contamination

d. Addition of medications with fluid in motion

OBJECTIVE 3

Identify common sites for intravenous therapy. Write the letter of the correct answer in the blank provided.

___ 1. The most common site for intravenous therapy is the

a. foot

b. subclavian

c. lower arm

d. upper arm

____2. The best choice for an IV site in a patient expected to receive IV's for a long period of time is

a. the back of the hand

b. the lower arm

c. the upper arm

d. any of the above

OBJECTIVE 4

Distinguish among the effects of isotonic, hypotonic and hypertonic intravenous fluid. Write the letter of the correct answer in the blank provided.

____1. Which type of solution is most similar to normal blood plasma?

a. Hypertonic

b. Isotonic

c. Hypotonic

d. All of the above

____2. Which type of solution is more concentrated than plasma?

a. Hypertonic

b. Isotonic

c. Hypotonic

d. All of the above

____3. Which type of solution is less concentrated than plasma?

a. Hypertonic

b. Isotonic

c. Hypotonic

d. All of the above

___ 4. Normal saline is

a. D5W

b. D5 0.45% NaCl

c. Ringer's Solution

d. 0.9% NaCl

___ 5. Which type of solution is used to decrease edema?

a. Hypertonic

b. Isotonic

c. Hypotonic

d. All of the above

___ 6. Which type of fluid must be given slowly to prevent circulatory overload?

a. Hypertonic

b. Isotonic

c. Hypotonic

d. All of the above

___ 7. Which of the following fluids is hypotonic?

a. D5W

b. D5RL

c. 0.9%NaCl

d. 0.45% NaCl

___ 8. Which fluid is used for electrolyte replacement?

a. D5W

b. D5RL

c. D10W

d. 0.9% NaCl

OBJECTIVE 5

Identify the advantages and disadvantages of intravenous therapy. Write an "A" in the blank before each advantage of intravenous therapy and a "D" in the blank before each disadvantage of intravenous therapy.

____1. Fluid overload

____2. Infections

____3. Severe allergic reactions

____4. Rapid effects

____5. Tissue extravasation

____6. Less irritating

____7. Fluid replacement

OBJECTIVE 6

Discuss the steps of the nursing process as they relate to patients receiving IV therapy.

____

____

____

____

____

____

____

____

____

____

OBJECTIVE 7

Calculate rate of flow of IV fluids. Perform the necessary calculations for each situation and record your answer in the spaces provided.

1. Mr. Hernandez should receive 1000 cc of fluid every 6 hours. The set delivers 20 gtt/cc. What rate of flow should be maintained for Mr. Hernandez? ______________________

2. Ms. Kuehl received 100 cc of fluid over a 2 hour period. The set used delivered 60 gtt/cc. What rate of flow was maintained for Ms. Kuehl? ______________________

3. If Ms. Troupe should receive 500 cc of fluid over the next 12 hours, what rate of flow will need to be maintained with a set delivering 60 gtt/cc? ______________________

4. Krissy Jenner must receive 50 cc of fluid within the next 30 minutes. If the set delivers 10 gtt/ c, what flow rate will need to be maintained? ______________________

5. Mrs. Shultz is receiving intermittent infusion of IV antibiotics. This shift she is to receive two doses of 100 cc. and one dose of another drug in 150 cc. What should be recorded for her IV intake? ______________________

6. Mr. Jasper is receiving 1000 cc of fluid every 12 hours. His IV was infiltrated and required replacing during the present 8 hour shift. The IV was not functioning for 1 1/2 hours.

   a. What amount of fluid should he have received if the IV had not infiltrated? ______________________

   b. If the previous shift left 400 cc to count, how many cc *would have been expected* to be left by the present shift?

      ____

   c. What amount of fluid can be expected to be received during this shift? ______________________

   d. If the previous shift left 200 cc to count, how many cc will be left to count after the present shift? ____________

OBJECTIVE 8

Select appropriate guidelines for assisting with IV therapy. Write the correct letter in the blank.

___ 1. The nurse's responsibility in assessing IV therapy includes

   a. assessing the equipment

   b. assessing the patient

   c. documenting the information obtained

   d. all of the above

____2. The equipment should be assessed to determine

a. correct set-up

b. proper functioning

c. both a and b

d. none of the above

____3. Tubing should be free of all these except

a. kinks in tubing

b. obstacles

c. air in tubing

d. fluid in tubing

____4. The connection between the tubing and IV cannula should be

a. easily accessible

b. tight

c. sealed with tape

d. none of the above

____5. The site should be inspected for

a. redness and edema

b. tightness and burning

c. pain at the site

d. all of the above

____6. To maintain the rate of flow, the nurse should observe the

a. controller only

b. drip chamber

c. tubing

d. none of the above

___ 7. Adjustments to the rate of flow are made by tightening and loosening the

a. on/off clamp on the tubing

b. roller device on the tubing

c. cannula connection

d. drip chamber

___ 8. Air bubbles in the tubing may

a. increase the rate of flow

b. cause greater pressure

c. decrease the rate of flow

d. none of the above

___ 9. Documentation of IV intake is preformed at least

a. every 4 hours

b. every 24 hours

c. once per shift

d. every hour

__ 10. The most important aspect of IV therapy to be documented is the

a. method of infusion

b. fluid level

c. rate of flow

d. assessment of the site

__ 11. A single IV fluid container should not be hanging for more than

a. 4 hours

b. one shift

c. 16 hours

d. 24 hours

OBJECTIVE 9

Identify the purpose and risks of infusion pumps. Write the letter of the correct answer in the blank provided.

____1. What action should the nurse take after ambulating a patient with an IV infusion pump?

a. Plug in the infusion pump

b. Allow patient to disconnect pump after ambulation

c. Leave infusion pump turned away from patient view

d. Turn off alarm

____2. IV controllers can detect which of the following?

a. Air in tubing

b. Obstruction

c. Insufficient fluid

d. All of the above

____3. An infusion pump

a. causes more damage than gravity pumps

b. causes less damage than gravity pumps

c. acts by pumping fluids in the reverse direction

d. replace the need for constant assessment of the patient

NOTICE

In addition to the pretest items, the student will be required to master the following objectives.

OBJECTIVE 10

Apply the nursing process to care for patients receiving intravenous therapy. SCORE_____

OBJECTIVE 11

Demonstrate the ability to

a. Assess and document IV therapy. RATING ___

b. Change peripheral IV tubing. RATING ___

c. Change IV dressings. RATING ___

d. Discontinue intravenous therapy. RATING ___

e. Convert an IV to a heparinized lock and maintain. RATING ___

f. Change flow rate. RATING ___

g. Change IV container. RATING ___

INFORMATION SHEET

ASSIST WITH INTRAVENOUS THERAPY

V

OBJECTIVE 1

Identify the general purposes for intravenous therapy.

Intravenous (IV) therapy is a method of

- Administering medications directly into the vascular system
- Administering fluids directly into the vascular system

Medications which are given by this route act the most rapidly of all parenteral routes and when given correctly, cause less irritation.

Fluid replacement is the most common purpose for continuous intravenous therapy.

OBJECTIVE 2

Distinguish among the methods of medication administration using intravenous therapy.

Medications can be given intravenously using several different methods. These methods are listed below.

- **Piggyback method**—The most common method is the use of a piggyback or small bag of fluid in which the medication has been added. This small bag is connected (piggybacked) into the main intravenous line. The medicated fluid is then allowed to run into the main line first. The bag of fluid which is hung higher will run into the main line first.

  Most intravenous systems now available allow the piggyback to run in and the main line to resume. Usually these piggyback systems work by gravity. A common use for this method is intravenous antibiotic therapy. A piggyback may also run directly into a heparin lock device, which allows for intermittent administration of intravenous fluid.

- **Add medication to main IV fluid**—A second method of administering medications by the intravenous route is to add the medication directly into the main IV fluid. This method is used when the medication needs to be diluted in large amounts of fluid. This provides for a continuous infusion of the medication. Typically, the addition of the medication into the fluid is performed in the pharmacy under a laminar flow hood which decreases the possibility of contamination. Electrolytes, such as potassium chloride (KCL), are commonly administered to the patient in this manner. More recently, for treatment of severe pain, morphine has been used as a continuous drip.

- **Use volume control set**—Another method of medication administration intravenously is the use of a volume control set. The drip chamber is filled on a frequent basis, once every 1/2 - 2 hours, with the desired amount of fluid. Medication may be added to this fluid. Volume control sets are used to decrease the chance of fluid overload and allow for more accurate determination of intravenous intake. They are commonly used for intravenous therapy in children.
- **Use intravenous push**—The fourth method for intravenous medication administration is the intravenous push, also known as a bolus. This method is the introduction of one medication directly into the vein. Although rarely used, the vein may be punctured solely for the administration of this medication as would be seen when giving an injection of 50% Dextrose in severe hypoglycemia. An IV push or bolus may also be given into an existing IV at an injection port closest to the IV cannula. This method may be used for emergency drugs, those which cannot be diluted, or when peak blood levels are desired quickly. However, this method is rarely used by LPN's.
- **Use infusion ports**—One of the newer forms of administration of intravenous medication is the utilization of infusion ports. Infusion ports are small devices which are implanted under the skin of the chest wall. The devices have a long catheter which delivers the medication into a large vessel or the right atrium. Usually the device is round. The surface of the devise that is placed directly beneath the skin has a self-sealing rubber covering, which can be punctured several times. Most infusion ports require special needles. These devices are useful in patients who receive chemotherapy or hyperalimentation in long term treatment.

OBJECTIVE 3

Identify common sites for intravenous therapy.

Intravenous fluids or medication are infused into veins. The most common site is found in the arm. Ideally, the first IV insertion site should be located as distal as possible. This is true regardless of which extremity is being used. This prevents the need to restart an IV at a more distal site should infiltration or phlebitis occur. The site is usually assessed for quality of the vein, length of straight vein tissue, distal fork of vein, as well as for stability of the IV and convenience of the patient. Sites which are close to joints are much more difficult to maintain and are usually a great inconvenience to the patient. The back of the hand and the forearm are the most commonly used areas, but in some situations the foot may be used. However, assessment for possible thrombophlebitis should be done.

OBJECTIVE 4

Distinguish among the effects of isotonic, hypotonic, and hypertonic intravenous fluid.

Fluid replacement therapy is the second, and usually more common, purpose for intravenous therapy. The solutions used to replace human fluids are

- **Isotonic**—Isotonic solutions are the most similar to normal blood plasma. The most common is 0.9% NaCl, which is referred to as normal saline.
- **Hypertonic**—Hypertonic solutions are more concentrated than plasma and act to draw fluid from the cells into the bloodstream.

  WARNINGS: Give hypertonics slowly to prevent circulatory overload. Sudden decrease in dextrose concentration in IV fluid may cause hypoglycemia to occur.
- Hypotonic—Hypotonic solutions, which are less concentrated than plasma, provide for fluid to be drawn from the bloodstream into the interstitial cells.

SOLUTION ABBREVIATION

There are several abbreviations which are used in combination to form various IV fluids. The most common components of IVs are

	Common components of IVs
D5	Dextrose 5%
D10	Dextrose 10%
D20	Dextrose 20%
W	Water
NS	Normal Saline 0.9% NaCL (sodium chloride)
1/2NS	Half normal saline 0.45% NaCL
1/4NS	Quarter normal saline 0.2% NaCL
RL	Ringer's Lactate or LR Lactated Ringer's

Examples of common combinations are D5NS or D5W

Below is a chart giving some of the common IV solutions with their classification and some of the common uses.

CLASSIFICATION	SOLUTION	USES
Isotonic	0.9% NaCl	Fluid replacement; only fluid to be administered when blood is being given
	D5 1/4NS same as D5 0.2% NaCl	Fluid replacement; supplies calories
	D5W	Correct or maintain fluid balance; supply calories
	Ringer's solution	Dehydration; sodium depletion GI fluid loss replacement
	Lactated Ringer's	Surgical or GI fluid loss replacement; sodium depletion; acidosis; burns
Hypertonic	D10W	Fluid replacement; supplies calories
	D20W	Fluid replacement; supplies calories
	D50W	Fluid replacement; supplies calories
	D5 0.45% NaCl	Dehydration; sodium depletion fluid replacement; calories
	D5 0.9% NaCl	Dehydration; sodium depletion fluid replacement; calories
	D10 0.9% NaCl	Dehydration; sodium depletion fluid replacement; calories
	D5 Lactated Ringer's	Dehydration; electrolyte replacement; acidosis
	D10 Lactated Ringer's	Dehydration; electrolyte replacement; calories
Hypotonic	0.45% NaCl	Edema; do not use with hypernatremia

OBJECTIVE 5

Identify the advantages and disadvantages of intravenous therapy.

Intravenous therapy can truly be said to be a life saver. However, there are both advantages and disadvantages to intravenous therapy; therefore, it must be used with great caution.

ADVANTAGES

- Provides an effective method for fluid replacement—This ability to replace fluids can drastically alter the outcome of many illnesses.
- Provides a route of medication administration—This method of medication administration provides medications to take effect rapidly when necessary as in emergency situations.
- Provides for administration of medication and fluids to patients who may be unable to tolerate other forms.

DISADVANTAGES

- Fluid overload
- Tissue extravasation
- Phlebitis
- Infections
- Severe allergic reactions

The risks of these problems are present with every IV. Therefore, every nurse must be responsible in preventing possible problems in order for the patient to enjoy the benefits of IV therapy.

To safely maintain an IV and decrease the chances for adverse effects, the nurse must utilize the nursing process. The nurse should continually assess the patient and the IV for correct infusion and document this assessment. The nurse should also implement the preventive measures outlined by hospital policy such as regular tubing changes. All actions regarding the assessment should be documented in the patient's chart. Some facilities have a checklist while others use the nurse's notes for this information.

OBJECTIVE 6

Discuss the steps of the nursing process as they relate to patients receiving IV therapy.

The nursing process in relation to intravenous therapy includes

1. **Assessment**—Initial patient assessments should include age, vital signs, body weight, and the patient's general condition. These will provide baseline data for analysis to determine the patient response or tolerance to the treatment.

   On-going assessments of the patient, catheter site, dressing, and the administration rate and equipment are included in this.

2. **Analysis**—Indications of complications of fluid over-load, infection of the insertion site of the catheter, and any patient assessments that need to be reported to the charge nurse or physician are included in this step. Common malfunctions of the IV equipment and approaches to solving the problems should be discussed in class as they relate to the analysis step.

3. **Planning**—Various equipment, pumps, sizes and types of containers, tubing and preparation for administering or maintaining intravenous therapy are necessary to the planning step. It is also part of planing to know facility policy and procedure.

4. **Implementation**—Sterile technique in regard to IV piggy-back medications, maintaining dressing site and function of equipment and flow rates are associated to the implementation step.

5. **Evaluation**—Patient assessment data that indicates effectiveness of intravenous therapy and the required documentations associated with this treatment are included in the evaluation step.

Although most care of intravenous therapy is routine, the individual patient must be considered. It is sometimes necessary to provide special measures for patients who are presently on intravenous therapy. The nurse should implement basic knowledge of patient care as well as using the time to teach the patient more about the intravenous therapy.

OBJECTIVE 7

Calculate rate of flow of IV fluids.

Intravenous fluids can be very dangerous if the rate is not maintained at the recommended amount. It is important for all nurses to be able to calculate the correct rate and to be able to determine if this is the rate being infused. Infusion pumps generally make this step easier by providing a more accurate and consistent method of delivery. The amount is set on the pump and the pump delivers that amount. The nurse must still check to see that the pump is reliable on a regular basis.

To determine the rate of an IV, the nurse must know the total amount of fluid to be infused, the amount of time over which that amount is to be infused and the gtt/cc capacity of the tubing being used to deliver the fluid. The formula is as follows:

$$\frac{\text{total amount of solution} \times \text{tubing drop factor}}{\text{hours to be infused} \times \text{60 minutes}} = \text{gtt/min}$$

EXAMPLE: A physician orders 1000 cc of 0.9% NaCl to run over 12 hours. The administration set delivers 10 gtt/min.

$$\frac{\text{1000 cc} \times \text{10 gtt}}{\text{12 hr} \times \text{60 min}} = \frac{\text{10000 gtt}}{\text{720 min}} = \text{13.8 or 14 gtt/min}$$

This solution should be given at 14 gtt/min.

OBJECTIVE 8

Select appropriate guidelines for assisting with IV therapy.

General Guidelines

It is essential to the patient's health to make quick and accurate assessments of intravenous therapy. The nurse should become proficient in recognizing problem areas. The nurse has three basic parts of this responsibility:

- to assess the equipment
- to assess the patient
- to document the information obtained. If information is abnormal the charge nurse should also be informed.

The equipment should be assessed to determine correct set up and functioning. The solution container should be inspected to determine if correct fluid is contained, and if sufficient fluid is contained for reasonable time, and the time tape is accurate. Also, the container should be checked for leaks. If the IV is on a pump or controller, check that the machine is plugged in, that the alarm is turned on, and that it is registering drips correctly. Drop rate should be determined and checked to ensure it is correct. If responding to alarm, start at most common cause for this alarm to go off.

WARNING: Never turn off an alarm on an infusion pump or controller.

Tubing should be checked next. The drip chamber at the top of the tubing should contain a moderate level of fluid so that drips fall freely into tubing and no air enters between drips. Tubing should be free of obstacles such as bed rails and not wrapped around under patient. Tubing should be free of kinks. Check for air in tubing. If noted find source. All tubing connections should be checked. Any separation of the tubing increases chance for infections as a result of the IV. Ports in the tubing should be checked for leaks.

The next area to be inspected is the site. The connection between the tubing and the IV cannula should be tight. Tape should be dry and secure. Dressings should also be dry except for medication used at site. Check to determine if site is positional (flow rate varies drastically with changes in patient position). Use armboard, if necessary, but do not obstruct site. The site should be inspected for redness and edema. Any discomfort at site should be noted and reported. Tightness, burning, and pain at the site are the more common complaints which may signal a problem with the IV. It is also necessary to look at the vein above the site for any redness, hardness or increased temperature. These indicae phlebitis. Infiltration may be indicated by coolness and edema. Be sure to ask patient and don't wait for complaints.

The patient should also be assessed for other symptoms. Some of the less common IV reactions show general symptoms. These include changes in blood pressure, neck vein distention, rapid breathing, shortness of breath, generalized rash and itching, increased temperature, nausea and vomiting, backache and general malaise.

Regulation

To maintain the rate of flow the nurse should observe the drip chamber of the IV tubing and count using a watch with a second hand. The count should always be done for a fill minute and double checked for accuracy. The rate of pumps and controllers should also be double checked according to the manufacturer's recommendations. Adjustments are made by tightening and loosening the roller device on the tubing. Other clamps on the tubing allow for shutting off or opening the flow. These should not be used for flow regulation.

Factors which may change the rate of flow are:

The flow rate of the IV is ordered by the physician. It is the nurse's responsibility to adjust the IV to deliver the prescribed rate. After the rate of flow has been calculated, adjustments must be made to determine that the correct amount is being delivered. Infusion pumps generally make this step easier by providing a more accurate and consistent method of delivery. The amount is set on the pump and the pump delivers that amount. The nurse must still check to see that the pump is reliable on a regular basis.

Standard intravenous administration sets, however, may vary greatly. After calculating the rate, the nurse must count the drops in the delivery set for a full minute at the desired adjustments. Adjustments are made by tightening and loosening the roller device on the tubing. Other clamps on the tubing allow for shutting off or opening the flow. These should not be used for flow regulation.

Level of fluid—Full containers flow faster than almost empty ones

Gravity—The higher the container the greater the pressure causing faster flow

Drip chamber—Drip chamber should be just over one-half full

Tubing—Kinks or pressure on the tubing decreases flow rate, tubing may also be hanging below patient and pressure is not sufficient to counteract gravity

Clamps—All clamps should be open except for the flow adjustment clamp

Air bubbles—Air bubbles in the lines may decrease the rate of flow

Site—Obstructions at the site such as position of the limb, clots in the cannula or infiltration decrease flow rate

Documentation

All of these must be evaluated to properly adjust flow rate.

It is the nurse's responsibility to document the amount that the patient has actually received to allow for proper hydration of the patient as well as determination of implementation of prescribed treatment. Documentation of IV intake is performed at least once per shift for all patients receiving IV fluid. This includes intermittent forms of fluid.

Documentation of normality and deviation must be thorough. The type of fluid infusing and the equipment which is present should be documented. The most important aspect is documentation of the site. Note the patients response to the IV in general. If IV is being administered for fluid replacement, assessment for hydration status should be performed and documented. Determine the style of documentation which is required in the facility.

The nurse must determine on initial assessment of the patient the amount of IV fluid which is remaining from the last shift. The previous nurse should have an amount recorded, but the nurse which is now on duty has a responsibility to determine that the amount recorded is an accurate reflection of the amount. It is necessary to document the amount of fluid in the IV at any initial assessment. If it is not within the prescribed rate the nurse should notify the charge nurse and adjust the flow rate as necessary to obtain the prescribed rate of flow.

During her time on duty, the nurse should record any fluids hung. At the end of the shift the nurse calculates the total amount of fluids the patient has received, The amount remaining in the bottle is also documented for the next shift. The standard amount of IV fluids in one container is 1000 cc, although 500 cc should be used for IV fluids at rates of less than 1000 cc / 24 hours. A single IV fluid container should not be hanging for more than 24 hours.

Guidelines for changing tubing

In most facilities, medical experts now recommend that intravenous tubing be changed every 24 hours. If tubing is changed in addition to regular site changes, the patient's risk of encountering complications is decreased. A single container of intravenous solution should not run for more than 24 hours. When a solution runs over this time period, the likelihood of infection increases greatly; such a risk should not be taken.

You should only separate the tubing when you are changing it. Before actually changing the tubing, you should think through the task and plan the steps you will follow in order to minimize the risk of contaminating the IV. It is very important that you work quickly in order to maintain the sterility of the ends of the tubing.

Usually, the tubing is changed along with the bag of fluid. To change the tubing in an IV, you should

- Use the fluid to prime the tubing set—Priming is a process in which the fluid container is punctured and the drip chamber is filled to the correct level. Then fluid is allowed to flow through all of the tubing parts. Due to the varieties in tubing, you must be aware of the steps necessary to prime the set used in your facility. Some sets require inverting filters and chambers, while others are damaged by this action.
- Take the primed set into the patient's room and hang it on the IV pole
- Place a sterile gauze pad under the catheter hub connection
- Gently separate the catheter from the old tubing and connect the new tubing to the catheter hub—During this procedure, it is essential that you hold the catheter hub securely to prevent dislodging the catheter. You may see a backflow of blood. It is critical for you to verify that the catheter (or needle) is still in place.
- Immediately initiate the flow rate to prevent clot formation—The initiated flow should be a low rate.
- After checking the site, adjust the flow rate to the prescribed rate of infusion
- Label the fluid container and the tubing—Do not use magic markers directly on the bags, as there may be absorption through the plastic.
- Place a time strip on the fluid container marking the level desired for each hour

If the tubing is being changed in a fluid container, which is already hanging, reduce the flow rate to a minimal level. Quickly invert the bag only (maintain drip chamber above the level of the heart) and quickly change the tubing. Then, replace the tubing at the catheter hub as outlined above.

If the tubing changes are done on infusion pumps, the procedure usually remains the same. Some infusion pumps may require special actions in the event that there is no flow when the machine is not turned on. The tubing must match the machine and any attachments added accordingly. When working with pumps, always use the manufacturer's directions.

You should know the type of tubing used with the particular controller or pump within your facility.

Guidelines for changing IV dressings

At the present time there is much controversy over the use of dressings on the IV site. The dressing which may be commonly applied is a sterile gauze pad with an antibiotic ointment. There is some concern in the use of sterile gauze pads since they do not allow for visualization of the actual IV site between dressing changes. Some facilities have chosen to use a sterile transparent dressing on IV sites. Regardless of the material used, the purpose is to decrease chances of contamination and infection at the venipuncture site.

The dressing change should be done every 24 hours and labeled and documented to record the time. The old dressing is gently removed by loosening tape and removing. The catheter hub should be stabilized during this time as well as during the application of the new dressing. If using gauze, tape should be secure but restrict circulation or fluid flow in the area. Tape should never encircle the arm. As with any procedure that uses tape, make sure the patient is not allergic to the tape being used. When applying the antibiotic ointment, a small amount should be applied to the gauze and then carefully placed directly upon the venipuncture site. The venipuncture site should be inspected closely for signs of infection while exposed.

Guidelines for changing IV containers.

Many intravenous fluids run continuously and require changes in the containers when empty. Changes in IV containers are also necessary with intermittent infusions. Piggybacks are hung and changed in the same manner. They work by gravity and will infuse first if hung slightly higher than the main IV fluid. All IV fluid containers must be checked to assure that they are not contaminated by leaks of air or fluid.

Before changing the container, the nurse must close the clamp on the tubing which connects to the patient. This assures that the patient will not receive excess fluid or air during the container change procedure. Then, the nurse must remove the tubing from the present container, which is usually empty, and insert the tubing spike into the new container without contaminating the spike.

It is best to insert the spike into bags of fluid with the bag hanging from the IV pole. After the protective cover is removed, the port of the bag should be steadied to prevent puncture of the bag during insertion of the spike. Bottles should be spiked with the bottle placed on a firm surface. The cover of the stopper should be removed and the stopper swabbed with alcohol. (New bottles should be assessed for vacuum since loss of vacuum means the bottle has been contaminated.) The spike is then inserted into the stopper. The nurse should be careful to insert the spike into the large hole in the stopper which is not connected to the air vent. If an unvented bottle is being used, the tubing must have an air vent. After the bottle has been spiked it may then be inverted and hung on the IV pole.

The nurse is responsible for assuring proper infusion rate according to orders. Many facilities also require marking the container using tape or other device to quickly determine the proper level at intervals such as every hour. The fluid should always be labeled indicating date and time of initiation. The documentation of the procedure is completed by indicating type of fluid, time, date, rate of flow, and nurse's signature.

Guidelines for converting an IV to a heparinized lock.

The use of heparinized locks has increased greatly in recent years. A heparin lock is a small device which allows for intermittent administration of intravenous fluid or medication. In addition to regularly scheduled medication or fluids, a heparin lock may be placed as a precautionary measure in patients who may need emergency IV medications.

A heparin solution is used in a small chamber which attaches to the intravenous catheter hub. Each time medication or fluid is to be administered the heparinized lock is flushed with a dilute heparin solution both **before** and **after** administration. This maintains the heparin in the chamber and keeps the vein ready for use.

WARNING: Use heparin flush solution only. Do NOT use regular dilutions of heparin.

A continuous administration set may easily be changed to a heparin lock device. The technique is similar to changing tubing only the heparin lock device is the new tubing. Most heparin lock devices screw into the catheter hub and have a rubber port on the end. The device should be primed with heparin solution prior to attaching to catheter hub. After the connection is secure the nurse should aspirate for blood using a syringe with heparin solution in it to determine if catheter remains in vein. The amount of heparin solution to be used to seal the device varies with each manufacturer. It is essential to be aware of the requirements of the specific equipment and the facility policy prior to use of heparinized lock devices.

Guidelines for discontinuing an intravenous infusion

When the site needs to be changed or the intravenous therapy is complete, it becomes necessary to discontinue the infusion. The process is not complicated but should be performed with care. The nurse should only perform final discontinuing of an IV with a written order.

The patient is instructed of the procedure. A sterile sponge and adhesive dressing should be ready for use. Gloves should be worn due to likelihood of blood contact. The infusion is then clamped. The needle should be stabilized and then the tape around the site loosened and removed. A tourniquet may be placed above the site according to facility policy. The catheter hub should be grasped firmly with the dominant hand; the non-dominant hand should hold the arm and stabilize the site. A gauze pad is applied gently to the site and the catheter is removed. The needle should remain parallel with the surface of the skin during removal. The catheter tip is inspected to determine that tip is intact. If intact, the tourniquet may be removed. Apply pressure to venipuncture site until all bleeding is stopped. Apply adhesive bandage. Equipment should be disposed of properly and the procedure documented.

OBJECTIVE 9

Identify the purpose and risks of infusion pumps.

PURPOSE

Infusion pumps and controllers are used to

- Provide a constant surveillance of the intravenous infusion
- Sound an alarm which signals any deviation from normal

Most infusion pumps and controllers are able to perform the following functions:

- Determine the rate of flow of the infusion
- Check for air
- Check for obstructions
- Check for sufficient fluid in the tubing

RISKS

Problems one may encounter when using a controller or an infusion pump include

- **Simply failing to plug the controller in after ambulation of a patient**—Usually the controller can run on battery power, but you should reconnect to a stable power source to prevent loss of power from a low battery. Even with the IV pump or controller, you are still responsible for frequent checks on the IV.
- **An infusion pump may disregard irregular situations**—Because of automation, an irregularity such as extravasation (infiltration), in which there is no blockage of the fluid's flow, may occur. For this reason pumps are more likely to cause greater damage to the tissue than a gravity set.
- **An infusion pump may act to pump in the reverse direction**—If set up improperly, the pump may act to pump fluid from the patient into the container. For this reason you should always double check that the correct tubing is being used and that all parts are being used according to the manufacturer's guidelines.

Pumps and controllers have made IV maintenance easier, but do not replace the nurse for assessment of individual patient reactions.

WARNING Pumps and controllers vary greatly with the manufacturer. For this reason, only employees trained to use the particular model found in their facility should be allowed to operate them.

Total Parenteral Nutrition

Just as the name implies, the purpose of total parenteral nutrition is to meet the basic nutrition needs of the patient. There are many patients who are unable to take in food or unable to absorb nutrients through the GI tract. A method of delivering nutrition intravenously is used frequently now.

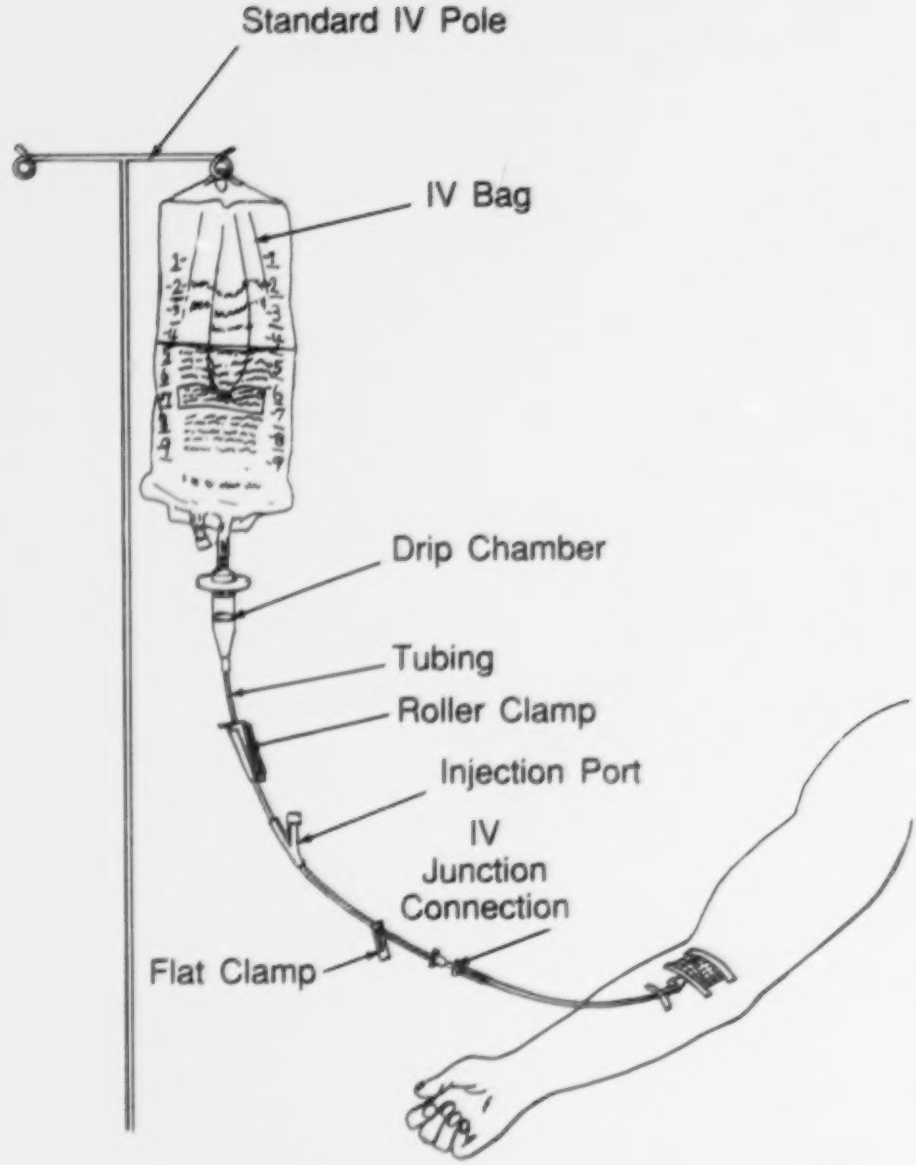
Total parenteral nutrition, also called hyperalimentation, is composed of amino acid, hypertonic glucose and other additives. The components vary with the needs of the individual. Additives may be vitamins, minerals, electrolytes or trace elements. The determination of the specific composition are made by the physician based on the results of the most recent blood studies.

The hypertonic glucose and the amino acids provide for the basic caloric needs of the patient by delivering calories from both carbohydrate and protein sources. In addition to these, there may be times when a patient may need fats to maintain normal function. Intralipids or fat emulsions may be given to meet these needs.

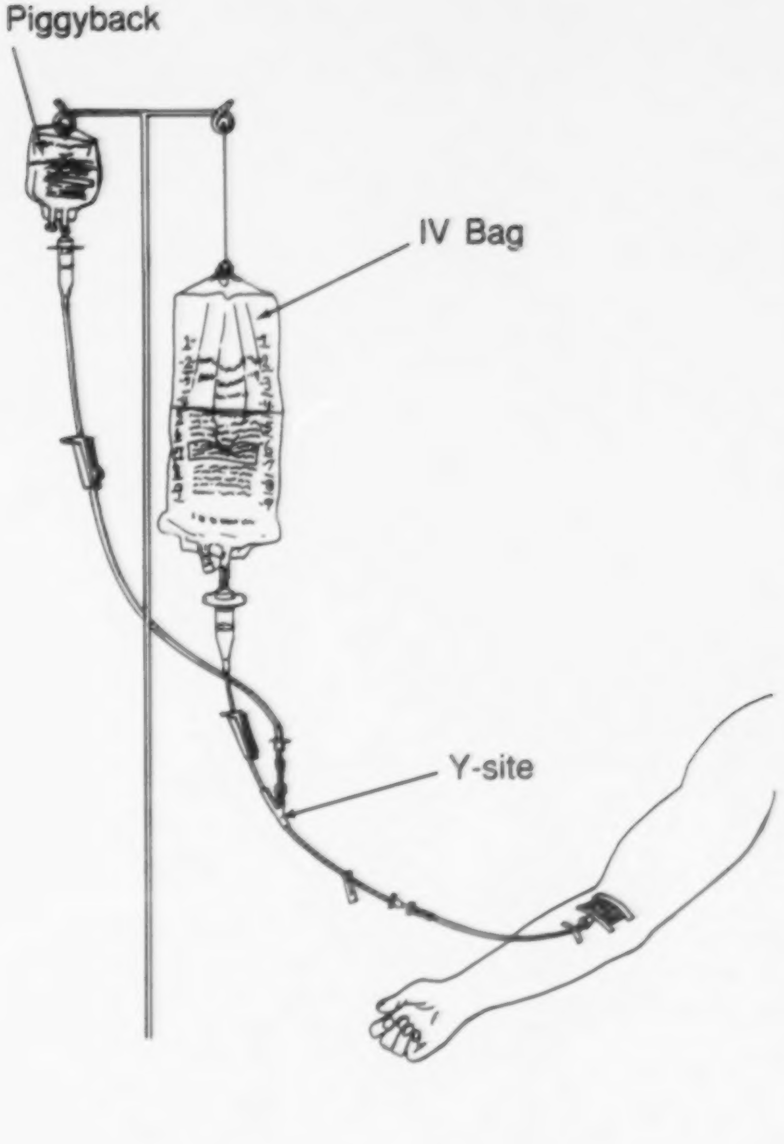
It is recommended that these fluids not be given peripherally due to the likelihood of infection and extravasation in the smaller vessels. Site care must be meticulous. Most hyperalimentation fluids have a high sugar content which makes them even more attractive than usual to bacterial contamination. Dressing changes must be maintained as completely sterile. These fluids should always be used with a pump or controller to maintain completely accurate rates of delivery since the concentration can cause severe reactions if overload occurs.

Many of the patients who recieve hyperalimentation require education and training for home use. Most patients adapt well to the care necessary. The nurse should become familiar with the latest recommendations for care of these patients and the equipment used to deliver hyperalimentation.

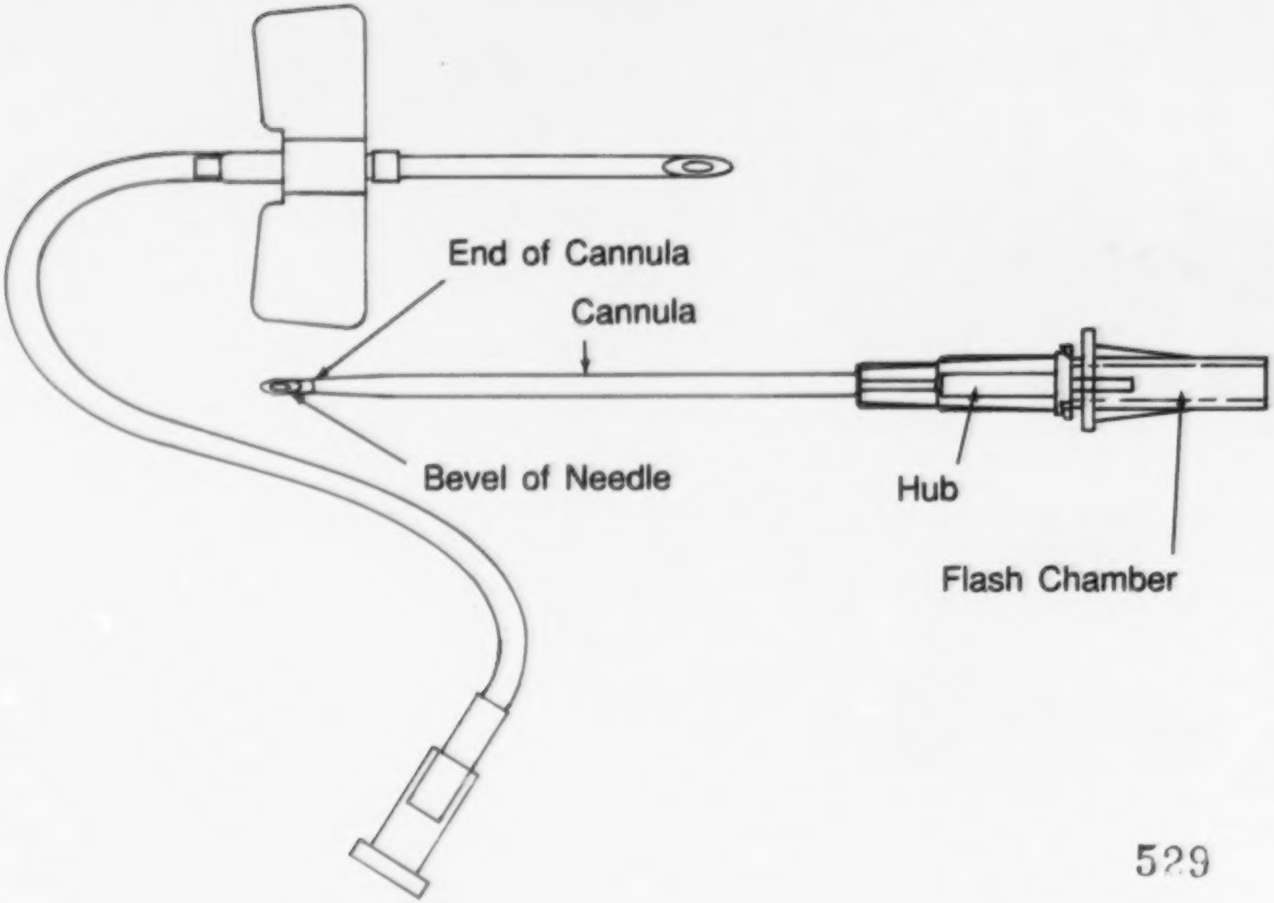
IV Equipment


Standard IV Pole
IV Bag
Drip Chamber
Tubing
Roller Clamp
Injection Port
IV
Junction
Connection
Flat Clamp

IV Equipment
(continued)


Piggyback
IV Bag
Y-site

IV Needles


End of Cannula
Cannula
Bevel of Needle
Hub
Flash Chamber

ACTIVITY SHEET 1

ASSIST WITH INTRAVENOUS THERAPY

V

DIRECTIONS

Calculate the rate of flow for the following orders.

Order **Rate of flow**

1. 500 cc to run over 6 hours Set delivers 15 gtt/cc. __________
2. 1000 cc to run over 8 hours Set delivers 10 gtt/cc. __________
3. 150 cc to run over 1 hour. Set delivers 60 gtt/cc. __________
4. 3000 cc to run over 24 hours. Set delivers 20 gtt/cc. _______

ACTIVITY SHEET 2

ASSIST WITH INTRAVENOUS THERAPY

DIRECTIONS

The following situations reflect the information necessary to correctly document IV intake. Perform the necessary calculations for each situation and record your answer in the spaces provided.

1. Mrs. Park has 1000 cc of D5W ordered to run every 8 hours. Her infusion pump is infusing the fluid accurately and she has no other fluid. The last 8 hour shift left 750 cc remaining and this was verified on assessment. What amount could the next shift expect to leave remaining?

   ____

2. Mr. Carver has an IV at a keep open rate of 20 cc per hour. He also receives one 150 cc infusion of antibiotics during the shift. The documented amount left from the previous 8 hour shift was 300 cc (500 cc bag). This was checked and verified.

   a. If hospital policy requires infusion of regular fluids to be maintained at a prescribed rate regardless of additional fluids, how much should be left to count for the next shift?

   ____

   b. What would the total fluid intake be for the shift?

   ____

   c. If hospital policy allowed flow rate to be replaced for 1 hour for each piggyback or intermittent IV medication, how much should be left to count for the next shift?

   ____

   d. What would the total IV fluid intake be for the shift?

   ____

ASSIST WITH INTRAVENOUS THERAPY

ACTIVITY SHEET 1

1. 20.8 or 21 gtt/min
2. 20.8 or 21 gtt/min
3. 150 gtt/min
4. 41.6 or 42 gtt/min

ACTIVITY SHEET 2

1. 750 cc
2. a. 140 cc
   b. 310 cc
   c. 160 cc
   d. 290 cc

ASSIGNMENT SHEET 1

ASSIST WITH INTRAVENOUS THERAPY

V

OBJECTIVE 9

Apply the nursing process to care for patients receiving intravenous therapy.

NAME ______________________________ SCORE ________

DIRECTIONS

Read the following situations and determine ways to help these patients.

1. Mrs. Shafter is agitated. She is receiving intravenous fluids for dehydration. She has pulled out one IV and has just had another IV started. What are some precautions that may be helpful in maintaining the IV?

____

____

____

____

2. Mr. Block has a fractured right arm which is in a cast. His IV has been placed in the antecubital fossa (the bend of the elbow). What are measures that may be necessary to maintain the IV and the basic care of this patient?

____

____

____

____

3. Mrs. Kemper has had many IVs. She now has an IV in her left foot. She is 58 and is usually mobile. What measures may be necessary to implement that will maintain maximum independent function?

____

____

____

____

4. An infant has had an IV placed in a scalp vein. What are some devices which may be used to maintain the site?

ASSIST WITH INTRAVENOUS THERAPY

ASSIGNMENT SHEET 1

Possible answers.

1. An armboard may be useful. Determine cause for patient discontinuing IV and meet the need that may stop this. Restraint would be last choice of action.
2. An armboard may be applied, but the nurse must meet more needs of this patient such as assistance with eating, daily hygiene and changing dependence/independence status.
3. Provide extra tubing to accommodate IV in foot. Assess patient for understanding of care of IV and site. Provide appropriate covering such as plastic bag if shower is taken.
4. A plastic medicine cup or a styrofoam cup may be taped over the site to protect it or a thick dressing. Determine positioning necessary to work with these.

JOB SHEET 1

ASSIST WITH INTRAVENOUS THERAPY

OBJECTIVE 11a **Assess and document intravenous therapy.**

EQUIPMENT AND SUPPLIES

- IV fluid
- IV controller (optional)
- IV tubing
- IV catheter
- patient or mannikin
- Nurse's notes or appropriate checklist

PROCEDURE

Assessment and Analysis

1. Check physician's order for IV
2. Calculate rate of flow for prescribed rate and double check.

Planning

3. Wash hands
4. Gather equipment

Implementation

5. Identify patient
    a. check ID band
    b. ask patient's name
6. Check equipment
    a. check solution for correct type
    b. check solution level
    c. check time tape, replace if needed
    d. check bag/bottle for leaks

    e. check controller and have plugged into outlet
    f. check that alarms are turned on
    g. check that drops are registering correctly
    h. check that level of fluid in drip chamber is correct
    i. check that drip rate is correct
    j. check for air in tubing
    k. check tubing to make sure free of obstructions
    l. check tubing for kinks and release if found
    m. check tubing ports for leaks
    n. check tubing connections for security

Evaluation

7. Inspect site
    a. check connection of tubing and cannula for tightness
    b. check tape, should be dry and secure
    c. check dressing, if used, for dryness
    d. check for positional flow
    e. apply armboard if needed
    f. assess for local redness or edema at site
    g. assess area above site for redness, hardness and/or warmth
    h. ask patient how the site feels
8. Assess patient for generalized complaints

Documentation

9. Document assessment of
   a. type of fluid
   b. flow rate
   c. equipment
   d. appearance of site and surrounding area
   e. complaints of patient

JOB SHEET 2 — ASSIST WITH INTRAVENOUS THERAPY

V

OBJECTIVE 11b

Change peripheral IV tubing.

EQUIPMENT AND SUPPLIES

- IV administration set
- IV fluid
- IV pole
- sterile 2 x 2 gauze pad
- gloves
- sample chart

PROCEDURE

Assessment and Analysis

1. Verify order for IV fluid and rate of administration
2. Calculate rate of flow and double check

Planning

3. Wash hands
4. Gather equipment

Implementation

5. Identify patient
    a. check ID band
    b. ask patient's name
6. Instruct patient on procedure
7. Prime IV infusion set

    Option A-If new IV fluid (preferred)

    a. hang fluid from IV pole
    b. check that tubing clamp is closed
    c. insert spike into fluid

    d. loosen clamp

    e. prime drip chamber, filters, and tubing according to manufacturer's directions

Option B-If fluid hanging

    a slow rate to keep open rate

    b. invert fluid container and replace old spike with spike on new tubing

    c. maintain drip chamber above the level of the heart

    d. prime drip chamber and filters according to manufacturer's directions

    e. prime remainder of tubing eliminating all air pockets

8. Apply gloves

9. Place sterile 2 X 2 under catheter hub

10. Stabilize catheter hub

11. Disconnect catheter hub from old tubing

12. Connect catheter hub to new tubing

13. Open clamp on tubing for slow infusion rate

14. Wash hands

15. Label IV fluid and tubing

Evaluation

16. Check infusion and site

    a. no pain, burning or discomfort at site

    b. infusion flows easily

    c. no local swelling is noted

    d. if all normal, continue; if not, problem solve for cause and correct; if unable to correct, refer to facility policy regarding IV's

17. Set rate of flow to prescribed rate

18. Check equipment for proper functioning

19. Discard equipment and gloves

Documentation

20. Document procedure

JOB
SHEET 4

ASSIST WITH INTRAVE
THERAPY

V

OBJECTIVE 11d **Discontinue intravenous**

EQUIPMENT AND SUPPLIES

- Gloves
- Tourniquet
- Sterile gauze spo
- Adhesive dressin
- IV set up
- Patient or ma

PROCEDURE

Assessment an

1. **Check** ph

Planning

nursing **procedure does**

2. **Wash** h

3. **Set** up

Impleme

4. Ide

   a.

   b.

5.

6. name

7. dure to **patient**

loves.

lize intravenous **catheter hub.**

move old **dressing and tape carefully.**

Observe **venipuncture site.**

12. Place sterile gauze pad over venipuncture site

13. Hold arm and gauze pad with non-dominant hand

14. Remove needle with dominant hand

15. Inspect tip of needle

    a. if tip intact remove tourniquet

    b. if tip not intact tighten tourniquet; call for help

16. Apply pressure to stop bleeding

17. Apply adhesive dressing

18. Dispose of catheter in puncture proof container

19. Dispose of all equipment

20. Remove and dispose of gloves

21. Wash hands

Evaluation

22. Check patient for comfort

Documentation

23. Document procedure

545

JOB SHEET 5 — ASSIST WITH INTRAVENOUS THERAPY

V

OBJECTIVE 11e

Convert an IV to a heparinized lock and maintain.

EQUIPMENT AND SUPPLIES

- IV administration set
- IV catheter in patient or mannikin
- Syringe
- Heparinized solution
- Alcohol swab
- Tape
- Gloves
- Sample chart

PROCEDURE

Assessment and Analysis

1. Verify order to change IV to heparin lock device

Planning

2. Wash hands
3. Assemble equipment

Implementation

4. Identify patient
    a. check ID band
    b. ask patient's name
5. Explain procedure to patient
6. Put on gloves
7. Clean hub of heparin lock device with alcohol and allow to dry
8. Prime heparin lock device with heparin solution

9. Stop flow of IV fluid
10. Untape old tubing as necessary
11. Stabilize catheter hub
12. Disconnect old tubing
13. Place heparin lock device into catheter hub
14. Secure heparin lock device
15. Aspirate for blood
16. Inject amount of heparin solution required by facility or manufacturer
17. Withdraw syringe
18. Secure heparin lock device with tape as needed
19. Discard equipment
20. Wash hands

Evaluation

21. Check for patient comfort

Documentation

22. Document change to heparin lock device

JOB SHEET 6

ASSIST WITH INTRAVENOUS THERAPY

V

OBJECTIVE 11f Change flow rate.

EQUIPMENT AND SUPPLIES

- IV solution
- IV tubing
- Patient
- IV standard (pole)
- IV infusion pump (optional)

PROCEDURE

Assessment and Analysis

1. Read order sheet for prescribed intravenous fluid
2. Calculate correct flow rate and double check

Planning

3. Assure IV site is in good condition. If not, refer to facility policy for notification of charge nurse or other procedure
4. Wash hands
5. Gather equipment

Implementation

6. Identify patient
    a. check ID band
    b. ask patient's name
7. Evaluate type of IV equipment
8. Gravity Infusion:
    a. increase or decrease flow according to desired change in rate using roller clamp
    b. count drops for correct rate
    c. readjust until count for 1 full minute is prescribed rate

9. Infusion Pump:

    a. follow manufacturer's guideline to change infusion rate

10. Follow facility policy to mark IV bottle to indicate change in rate

Evaluation

11. Check for patient's comfort

Documentation

12. Document change in rate and condition of site

JOB SHEET 7

ASSIST WITH INTRAVENOUS THERAPY

OBJECTIVE 11g

Change IV container.

EQUIPMENT AND SUPPLIES

- IV bag or bottle
- IV tubing
- Chart with IV orders and IV flow sheet
- Alcohol swab

PROCEDURE

Assessment and Analysis

1. Determine present container is sufficiently infused. (Except for piggybacks, they should not be allowed to be completely empty.)
2. Read orders for IV

Planning

3. Wash hands
4. Obtain prescribed IV fluid
5. Identify patient
    a. check ID band
    b. ask patient's name

Implementation

6. Instruct patient as necessary
7. Clamp tubing
8. Prepare new container for spike insertion

    Bag:

    a. Hang on IV pole
    b. Remove protective cap

Bottle:

  a. Place on stable surface
  b. Remove stopper covering
  c. If no vacuum is present when removing covering, replace with new bottle
  d. Swab stopper cover with alcohol

9. Invert present IV container
10. Remove spike avoiding contamination
11. Insert spike into proper port of container
12. Place container in proper position for infusion
13. Check for correct flow rate
14. Label container according to facility policy
15. Wash hands

Evaluation

16. Check for patient's comfort

Documentation

17. Document change of IV container

JOB SHEET 1

Demonstrate ability to assess and document intravenous therapy.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Checked order		
2. Calculated rate correctly		
Planning		
3. Washed hands		
4. Gathered equipment		
Implementation		
5. Identified patient		
6. Checked equipment		
a. solution type		
b. solution level		
c. time tape correct or replaced		
d. leaks		
e. controller plugged in		
f. alarms on		
g. drops registering correctly		
h. drip chamber level correct		
i. drip rate correct		

The student:	Yes	No
j. no air in tubing	____	____
k. checked for obstructions of tubing	____	____
l. checked for kinks and released	____	____
m. checked ports for leaks	____	____
n. connections checked for security		

Evaluation

7. Inspected site		
a. cannula/tubing connection tight	____	____
b. tape checked, dry and secure	____	____
c. dressing dry and intact	____	____
d. checked for positional flow	____	____
e. armboard applied as needed	____	____
f. assessed for redness and edema	____	____
g. area above assessed correctly	____	____
h. asked patient about site	____	____
8. Assessed patient for general complaints	____	____

Documentation

9. Documented correctly		
a. type of fluid	____	____
b. flow rate	____	____
c. equipment	____	____
d. assessment factors	____	____
e. patient complaints	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Assessed/documented intravenous therapy				

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

JOB SHEET 2

Demonstrate ability to change peripheral IV tubing.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Verified order	_____	_____
2. Calculated rate	_____	_____
Planning		
3. Washed hands	_____	_____
4. Gathered equipment	_____	_____
Implementation		
5. Identified patient	_____	_____
6. Instructed patient	_____	_____
7. Primed IV infusion set correctly	_____	_____
8. Applied gloves	_____	_____
9. Placed gauze under hub	_____	_____
10. Stabilized catheter hub	_____	_____
11. Disconnected old tubing	_____	_____
12. Connected new tubing maintaining sterility	_____	_____
13. Opened clamp at slow rate	_____	_____
14. Washed hands	_____	_____
15. Labeled IV fluid and tubing	_____	_____

The student:	Yes	No
Evaluation		
16. Checked infusion and site	____	____
17. Set prescribed flow rate	____	____
18. Checked equipment	____	____
19. Discarded equipment and gloves	____	____
Documentation		
20. Documented procedure	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Peripheral intravenous tubing changed				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING	**Evaluator note:** To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.
PERFORMANCE EVALUATION KEY	4 - Skilled—Can perform job with no additional training 3 - Moderately skilled—Has performed job during training program; limited additional training may be required 2 - Limited skill—Has performed job during training program; additional training is required to develop skill 1 - Unskilled—Is familiar with process; but is unable to perform job

____________ ________________________

(Date) (Evaluator's Signature)

____

(Evaluator's Position)

PRACTICAL TEST 3

ASSIST WITH INTRAVENOUS THERAPY

V

JOB SHEET 3

Demonstrate ability to change IV dressing.

Student's name ____________________ Date ________

Evaluator's name ____________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Verified correct time	____	____
Planning		
2. Washed hands	____	____
3. Assembled equipment	____	____
Implementation		
4. Identified patient	____	____
5. Explained procedure to patient	____	____
6. Put on gloves	____	____
7. Stabilized catheter hub	____	____
8. Removed old dressing and tape	____	____
9. Observed venipuncture site	____	____
10. Placed a new dressing as specified	____	____
11. Taped securely	____	____
Evaluation		
12. Discarded equipment	____	____
13. Washed hands	____	____
14. Observed for correct rate of flow	____	____

The student:	Yes	No
Documentation		
15. Documented correctly	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Changed IV dressing				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training

3 - Moderately skilled—Has performed job during training program; limited additional training may be required

2 - Limited skill—Has performed job during training program; additional training is required to develop skill

1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 4

ASSIST WITH INTRAVENOUS THERAPY

V

JOB SHEET 4

Demonstrate ability to discontinue intravenous therapy.

Student's name ____________________________ Date ___________

Evaluator's name __________________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Checked physician's order	_____	_____
Planning		
2. Washed hands	_____	_____
3. Set up equipment	_____	_____
Implementation		
4. Identified patient	_____	_____
5. Instructed patient	_____	_____
6. Set up equipment	_____	_____
7. Clamped IV	_____	_____
8. Placed tourniquet as specified	_____	_____
9. Put on gloves	_____	_____
10. Stabilized needle	_____	_____
11. Loosened and removed tape	_____	_____
12. Placed gauze pad over venipuncture site	_____	_____
13. Held arm and gauze	_____	_____
14. Removed needle	_____	_____
15. Inspected needle and took proper action	_____	_____
16. Applied pressure to stop bleeding	_____	_____

The student:	Yes	No
17. Applied adhesive dressing	____	____
18. Disposed of catheter correctly	____	____
19. Disposed of all equipment	____	____
20. Removed and disposed of gloves	____	____
21. Washed hands	____	____
Evaluation		
22. Checked patient for comfort	____	____
Documentation		
23. Documented procedure	____	____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Discontinued IV infusion				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" on the following page.

PERFORMANCE EVALUATION KEY	4 - Skilled—Can perform job with no additional training 3 - Moderately skilled—Has performed job during training program; limited additional training may be required 2 - Limited skill—Has performed job during training program; additional training is required to develop skill 1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 5

ASSIST WITH INTRAVENOUS THERAPY

V

JOB SHEET 5

Demonstrate ability to convert an IV to a heparinized lock and maintain.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Verified order	_____	_____
Planning		
2. Washed hands	_____	_____
3. Assembled equipment	_____	_____
Implementation		
4. Identified patient	_____	_____
5. Explained procedure to patient	_____	_____
6. Put on gloves	_____	_____
7. Cleaned hub of heparin locked with alcohol	_____	_____
8. Primed heparin lock with heparin solution	_____	_____
9. Stopped flow of IV fluid	_____	_____
10. Untaped old tubing	_____	_____
11. Stabilized catheter hub	_____	_____
12. Disconnected old tubing	_____	_____

The student:	Yes	No
13. Placed heparin lock device into catheter hub	______	______
14. Secured heparin lock device	______	______
15. Aspirated for blood	______	______
16. Injected correct amount of heparin solution	______	______
17. Withdrew syringe	______	______
18. Secured heparin lock with tape	______	______
19. Discarded equipment	______	______
20. Washed hands	______	______
Evaluation		
21. Checked for patient comfort	______	______
Documentation		
22. Documented procedure	______	______

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Converted IV to heparinized lock				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 6

ASSIST WITH INTRAVENOUS THERAPY

V

JOB SHEET 6

Demonstrate ability to change flow rate.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. ____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Read order		
2. Calculated flow rate correctly		
Planning		
3. Assessed IV site, referred as necessary		
4. Washed hands		
5. Evaluated IV equipment		
Implementation		
6. Identified patient		
7. Evaluated Iv equipment		
8. Gravity Infusion:		
a. used roller clamp to change		
b. counted drops		
c. readjusted until correct for 1 minute		
9. Infusion Pump:		
a. followed manufacturer's guidelines		
10. Marked bottle according to policy		

The student: Yes No

Evaluation

11. Checked patient's comfort ____ ____

Documentation

12. Documented rate change ____ ____

EVALUATOR'S COMMENTS

____

____

____

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Changed flow rate				

EVALUATOR'S COMMENTS

____

____

____

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

PRACTICAL TEST 7

ASSIST WITH INTRAVENOUS THERAPY

V

JOB SHEET 7

Demonstrate ability to change IV container.

Student's name ______________________ Date __________

Evaluator's name ______________________ Attempt no. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

Evaluator note: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.

PROCEDURE

The student:	Yes	No
Assessment and Analysis		
1. Determined present container ready for change	_____	_____
2. Read IV orders	_____	_____
Planning		
3. Washed hands	_____	_____
4. Obtained prescribed IV fluid	_____	_____
5. Identified patient	_____	_____
Implementation		
6. Instructed patient as necessary	_____	_____
7. Clamped tubing	_____	_____
8. Prepared new container for spike insertion	_____	_____
9. Inverted present IV container	_____	_____
10. Removed spike avoiding contamination	_____	_____
11. Inserted spike into proper port of container	_____	_____
12. Placed container in proper position for infusion	_____	_____

The student:	Yes	No
13. Checked for correct flow rate	____	____
14. Labeled container	____	____
15. Washed hands	____	____
Evaluation		
16. Checked for patient's comfort	____	____
Documentation		
17. Documented change of IV container	____	____

EVALUATOR'S COMMENTS

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See performance evaluation key). A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:	4	3	2	1
Changed IV container				

EVALUATOR'S COMMENTS

AVERAGE RATING

Evaluator note: To obtain an average rating for the competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria. Circle the rating on the "Performance Evaluation Key" below.

PERFORMANCE EVALUATION KEY

4 - Skilled—Can perform job with no additional training
3 - Moderately skilled—Has performed job during training program; limited additional training may be required
2 - Limited skill—Has performed job during training program; additional training is required to develop skill
1 - Unskilled—Is familiar with process; but is unable to perform job

(Date)

(Evaluator's Signature)

(Evaluator's Position)

WRITTEN TEST

ASSIST WITH INTRAVENOUS THERAPY

V

NAME ________________________ SCORE ________

OBJECTIVE 1

Identify the general purposes for intravenous therapy. Write the letter of the correct answer in the blank.

___ 1. Which of the following is NOT a reason for giving intravenous therapy?

- a. Rapid absorption rate
- b. Fluid replacement
- c. Delivery into arterial system
- d. Inability to take other medication forms

___ 2. What is the most common reason for continuous intravenous therapy?

- a. Medication administration
- b. Fluid replacement
- c. Electrolyte depletion
- d. Caloric depletion

OBJECTIVE 2

Distinguish among the methods of medication administration using intravenous therapy. Write the letter of the correct answer in the blank provided.

___ 1. Which method of administration is used when the medication needs to be diluted in large amounts of fluid?

- a. Piggyback
- b. IV bolus
- c. IV push
- d. Addition to main solution

____2. Which medication is frequently added to large amounts of fluid for infusion?

a. Valium

b. Demerol

c. KCl

d. Vistaril

____3. The main purpose of the volume control set is to

a. add medication

b. increase IV observations

c. decrease chance of fluid overload

d. all of the above

____4. With which group is the volume control set used most frequently?

a. Children

b. Adults

c. Ambulatory patients

d. Elderly

____5. Which condition would necessitate the administration of 50% Dextrose IV bolus?

a. Myocardial infarction

b. Hypoglycemic

c. Anaphylactic

d. Hyperglycemic

OBJECTIVE 3

Identify common sites for intravenous therapy. Write the letter of the correct answer in the blank provided.

___ 1. The best choice for an IV site in a patient expected to receive IV's for a long period of time is

a. the back of the hand

b. the lower arm

c. the upper arm

d. any of the above

___ 2. Which site would be the easiest to maintain?

a. at the wrist

b. along the forearm

c. at the elbow

d. in the foot

___ 3. What special problem should be assessed in patients with the IV in the foot?

a. phlebitis

b. edema

c. thrombophlebitis

d. paralysis

OBJECTIVE 4

Distinguish among the effects of isotonic, hypotonic and hypertonic intravenous fluid. Write the letter of the correct answer in the blank provided.

___ 1. Which solution is most similar to blood plasma?

a. D5RL

b. D5W

c. 0.9% NaCl

d. 0.45% NaCl

____2. Which type of solution is used to treat fluid imbalance from burns?

a. Hypertonic

b. Isotonic

c. Hypotonic

d. None of the above

____3. Which of the following fluids is hypotonic?

a. D5 0.45% NaCl

b. D5W

c. 0.45% NaCl

d. Ringer's solution

____4. Which solution is hypertonic

a. D50W

b. 0.9% NaCl

c. D5RL

d. D5W

OBJECTIVE 5 **Identify the advantages and disadvantages of intravenous therapy.** Write the letter of the correct answer in the blank provided.

____1. Which of the following is an advantage of intravenous therapy?

a. Tissue extravasation

b. Fluid overload

c. Phlebitis

d. Fluid replacement

___ 2. Which of the following is a disadvantage of intravenous therapy?

a. Severe allergic reactions

b. Medication takes effect slowly

c. Easily tolerated

d. Drastically alters outcome of many illnesses

OBJECTIVE 6 **Discuss the steps of the nursing process as they relate to patients receiving IV therapy.**

In a short paragraph for each step, discuss the nursing process in relation to IV therapy.

Assessment ______________________________

____

____

____

Analysis ______________________________

____

____

Planning ______________________________

____

____

Implementation ______________________________

____

____

____

Evaluation ______________________________

____

____

OBJECTIVE 7

Calculate rate of flow of IV fluids. Perform the necessary calculations for each situation and record your answer in the spaces provided.

1. 50 cc to run over 30 minutes. Set delivers 10 gtt/cc. __________
2. 125 cc. to run over 1 hour. Set delivers 10 gtt/cc. __________
3. 250 cc. to run over 4 hours. Set delivers 15 gtt/cc. __________
4. Mrs. Shultz is receiving intermittent infusion of IV antibiotics. This shift she is to receive two doses of 100 cc. and one dose of another drug in 150 cc. What should be recorded for her IV intake?

   ____

5. Mr. Jasper is receiving 1000 cc of fluid every 12 hours. His IV was infiltrated and required replacing during the present shift. The IV was not functioning for 1 1/2 hours.

   a. What amount of fluid can be expected to be received during this shift?

      ____

   b. If the previous shift left 200 cc to count, how many cc will be left to count after the present shift?

      ____

   c. What amount of fluid should he have received if the IV had not infiltrated?

      ____

   d. If the precious shift left 400 cc to count, how many cc *would have been expected* to be left by the present shift?

      ____

OBJECTIVE 8

Select appropriate guidelines for assisting with IV therapy. Write an "X" in the blank before each appropriate guideline.

___ 1. IV equipment should be assessed to determine correct set-up.

___ 2. The solution container should be inspected to determine if correct fluid is contained.

___ 3. The solution container should be checked for leaks.

___ 4. If responding to an infusion pump or controller alarm, the alarm should be silenced.

___ 5. Tubing should be free of kinks.

___ 6. When inspecting the site, the connection between the tubing and the IV cannula should be tight.

___ 7. Redness at the site is normal but should be documented.

___ 8. Tightness, burning, and pain at the site are common complaints which may signal a problem with the IV.

___ 9. The nurse should observe the drip chamber of the IV tubing and count for a full minute when checking the rate of flow.

__ 10. Full containers flow slower than almost empty ones

__ 11. The drip chamber should be just over one-half full

__ 12. All clamps should be closed except for the flow adjustment clamps.

__ 13. In documenting, the most important aspect is documentation of the site.

__ 14. The nurse on duty is responsible for determining that the amount recorded is an accurate reflection of the amount infused.

__ 15. Periodically during the shift, the nurse should calculate the amount of fluids the patient has received.

OBJECTIVE 9 **Identify the purpose and risks of infusion pumps.** Write the letter of the correct answer in the blank provided.

____1. Which problem are pumps and controllers unable to detect?

a. Extravasation

b. Occluded vessel

c. Air in tubing

d. Lack of fluid for infusion

____2. Which of the following rules should be used with IV pumps and controllers?

a. Keep plugged in at all times

b. Keep fluid level high in drip chamber

c. Never turn off alarms

d. Never allow patient to walk alone with controller

____3. Which of the following is NOT a purpose of the pumps and controllers?

a. Check for obstructions

b. Regulate rate of flow

c. Constant surveillance of infusion

d. Monitor patient's reactions to IV

NOTICE The following assignment sheet and job sheets are not a part of the written test. If these activities have not been completed, check with your instructor.

OBJECTIVE 10 **Apply the nursing process to care for patients receiving intravenous therapy.** SCORE______

OBJECTIVE 11 **Demonstrate the ability to**

a. Assess and document IV therapy. RATING ____

b. Change peripheral IV tubing. RATING ____

580

c. **Change IV dressings.** RATING ___

d. **Discontinue intravenous therapy.** RATING ___

e. **Convert an IV to a heparinized lock and maintain.** RATING ___

f. **Change flow rate.** RATING ___

g. **Change IV container.** RATING ___

WRITTEN TEST ANSWERS

ASSIST WITH INTRAVENOUS THERAPY

V

OBJECTIVE 1	1. c
	2. b
OBJECTIVE 2	1. d
	2. c
	3. c
	4. a
	5. b
OBJECTIVE 3	1. a
	2. b
	3. c
OBJECTIVE 4	1. c
	2. b
	3. c
	4. a
OBJECTIVE 5	1. d
	2. a
OBJECTIVE 6	Possible answers include Assessment Should include information about initial assessments and on-going patient assessments

Analysis

Should include information about indications of complications or assessment which should be reported to charge nurse. Common malfunctions and approaches to solving the problems should be mentioned.

Planning

Should include information about knowing facility policy and procedures. Various equipment for administering or maintaining IV therapy.

Evaluation

Should include assessment data that indicates effectiveness of IV therapy and required documentations.

OBJECTIVE 7

1. 16.6 or 17 gtt/min
2. 20.8 or 21 gtt/min
3. 15.6 or 16 gtt/min
4. 350 cc
5. a. 541 cc approximately 550
   b. 658 cc approximately 650
   c. 666 cc approximately 650
   d. 734 cc approximately 750

OBJECTIVE 8

1, 2, 3, 5, 6, 8, 9, 11, 13, 14, 15

OBJECTIVE 9

1. a
2. c
3. b

OBJECTIVE 10

Refer to answers to Assignment Sheet 1.

OBJECTIVE 11

Refer to Practical Tests for Job Sheets 1 through 7.